

Thermal conductivity of liquids: Aliphatic ethers

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THERMAL CONDUCTIVITY OF LIQUIDS: ALIPHATIC ETHERS

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Data sheets for each of the liquids are given in the following order:

Formula	Name	Alternative Name(s)	
C₁ to C₄ DIALKYL ETHERS			
1. (CH ₃) ₂ O	Dimethyl ether	Methoxymethane Oxybismethane Methyl ether	7
2. CH ₃ OCH ₂ CH ₃	Methyl ethyl ether	Methoxyethane	8
3. CH ₃ O[CH ₂] ₂ CH ₃	Methyl propyl ether	1-Methoxypropane	9
4. CH ₃ OCH(CH ₃) ₂	Methyl isopropyl ether	2-Methoxypropane Methyl 1-methylethyl ether	10
5. (CH ₃ CH ₂) ₂ O	Diethyl ether	Ethoxyethane 1,1'-Oxybisethane Ethyl ether	11
C₅ DIALKYL ETHERS			
6. CH ₃ O[CH ₂] ₃ CH ₃	Methyl butyl ether	1-Methoxybutane	13
7. CH ₃ OCH(CH ₃)CH ₂ CH ₃	Methyl sec-butyl ether	2-Methoxybutane Methyl 1-methylpropyl ether	14
8. CH ₃ OCH ₂ CH(CH ₃) ₂	Methyl isobutyl ether	1-Methoxy-2-methylpropane Methyl 2-methylpropyl ether	15

Formula	Name	Alternative Name(s)	
9. $\text{CH}_3\text{OC}(\text{CH}_3)_3$	Methyl <i>tert</i> -butyl ether	2-Methoxy-2-methylpropane Methyl 1,1-dimethylethyl ether MtBE	16
10. $\text{CH}_3\text{CH}_2\text{O}[\text{CH}_2]_2\text{CH}_3$	Ethyl propyl ether	1-Ethoxypropane	17
11. $\text{CH}_3\text{CH}_2\text{OCH}(\text{CH}_3)_2$	Ethyl isopropyl ether	2-Ethoxypropane Ethyl 1-methylethyl ether	18
C₆ DIALKYL ETHERS			
12. $\text{CH}_3\text{O}[\text{CH}_2]_4\text{CH}_3$	Methyl pentyl ether	1-Methoxypentane	19
13. $\text{CH}_3\text{OCH}(\text{CH}_3)[\text{CH}_2]_2\text{CH}_3$	Methyl 1-methylbutyl ether	2-Methoxypentane	20
14. $\text{CH}_3\text{OCH}_2\text{CH}(\text{CH}_3)\text{CH}_2\text{CH}_3$	Methyl 2-methylbutyl ether	1-Methoxy-2-methylbutane 2-(Methoxymethyl)butane	21
15. $\text{CH}_3\text{O}[\text{CH}_2]_2\text{CH}(\text{CH}_3)_2$	Methyl isopentyl ether	1-Methoxy-3-methylbutane Methyl 3-methylbutyl ether 2-(2-Methoxyethyl)propane	22
16. $\text{CH}_3\text{OC}(\text{CH}_3)_2\text{CH}_2\text{CH}_3$	Methyl <i>tert</i> -pentyl ether	2-Methoxy-2-methylbutane Methyl 1,1-dimethylpropyl ether	23
17. $\text{CH}_3\text{CH}_2\text{O}[\text{CH}_2]_3\text{CH}_3$	Ethyl butyl ether	1-Ethoxybutane	24
18. $\text{CH}_3\text{CH}_2\text{OCH}(\text{CH}_3)\text{CH}_2\text{CH}_3$	Ethyl <i>sec</i> -butyl ether	2-Ethoxybutane Ethyl 1-methylpropyl ether	25
19. $\text{CH}_3\text{CH}_2\text{OCH}_2\text{CH}(\text{CH}_3)_2$	Ethyl isobutyl ether	1-Ethoxy-2-methylpropane Ethyl 2-methylpropyl ether	26
20. $\text{CH}_3\text{CH}_2\text{OC}(\text{CH}_3)_3$	Ethyl <i>tert</i> -butyl ether	2-Ethoxy-2-methylpropane Ethyl 1,1-dimethylethyl ether	27
21. $(\text{CH}_3[\text{CH}_2]_2)_2\text{O}$	Dipropyl ether	1,1'-Oxybispropane 1-Propoxypropane Propyl ether	28
22. $\text{CH}_3[\text{CH}_2]_2\text{OCH}(\text{CH}_3)_2$	Propyl isopropyl ether	2-Propoxypropane Propyl 1-methylethyl ether	29
23. $(\text{CH}_3)_2\text{CHOCH}(\text{CH}_3)_2$	Diisopropyl ether	2,2'-Oxybispropane Bis(1-methylethyl) ether 2-Isopropoxypropane Isopropyl ether	30
C₇ DIALKYL ETHERS			
24. $\text{CH}_3\text{O}[\text{CH}_2]_5\text{CH}_3$	Methyl hexyl ether	1-Methoxyhexane	31
25. $\text{CH}_3\text{CH}_2\text{O}[\text{CH}_2]_4\text{CH}_3$	Ethyl pentyl ether	1-Ethoxypentane	32
26. $\text{CH}_3[\text{CH}_2]_2\text{O}[\text{CH}_2]_3\text{CH}_3$	Propyl butyl ether	1-Propoxybutane	33
C₈ DIALKYL ETHERS			
27. $\text{CH}_3\text{O}[\text{CH}_2]_6\text{CH}_3$	Methyl heptyl ether	1-Methoxyheptane	34
28. $\text{CH}_3\text{CH}_2\text{O}[\text{CH}_2]_5\text{CH}_3$	Ethyl hexyl ether	1-Ethoxyhexane	35
29. $\text{CH}_3[\text{CH}_2]_2\text{O}[\text{CH}_2]_4\text{CH}_3$	Propyl pentyl ether	1-Propoxypentane	36
30. $(\text{CH}_3[\text{CH}_2]_3)_2\text{O}$	Dibutyl ether	1,1'-Oxybisbutane 1-Butoxybutane Butyl ether	37

Formula	Name	Alternative Name(s)	
31. $\text{CH}_3\text{CH}_2\text{CH}(\text{CH}_3)\text{OCH}(\text{CH}_3)\text{CH}_2\text{CH}_3$	Disec-butyl ether	2,2'-Oxybisbutane Bis(1-methylpropyl) ether sec-Butyl ether	39
32. $(\text{CH}_3)_2\text{CHCH}_2\text{OCH}_2\text{CH}(\text{CH}_3)_2$	Diisobutyl ether	1,1'-Oxybis(2-methylpropane) Bis(2-methylpropyl) ether Isobutyl ether	40
33. $(\text{CH}_3)_3\text{COC}(\text{CH}_3)_3$	Ditert-butyl ether	2,2'-Oxybis(2-methylpropane) Bis(1,1-dimethylethyl) ether tert-Butyl ether	41

C₉ DIALKYL ETHERS

34. $\text{CH}_3\text{O}[\text{CH}_2]_7\text{CH}_3$	Methyl octyl ether	1-Methoxyoctane	42
35. $\text{CH}_3\text{CH}_2\text{O}[\text{CH}_2]_6\text{CH}_3$	Ethyl heptyl ether	1-Ethoxyheptane	43
36. $\text{CH}_3[\text{CH}_2]_2\text{O}[\text{CH}_2]_5\text{CH}_3$	Propyl hexyl ether	1-Propoxyhexane	44
37. $\text{CH}_3[\text{CH}_2]_3\text{O}[\text{CH}_2]_4\text{CH}_3$	Butyl pentyl ether	1-Butoxypentane	45

C₁₀ DIALKYL ETHERS

38. $\text{CH}_3\text{O}[\text{CH}_2]_8\text{CH}_3$	Methyl nonyl ether	1-Methoxynonane	46
39. $\text{CH}_3\text{CH}_2\text{O}[\text{CH}_2]_7\text{CH}_3$	Ethyl octyl ether	1-Ethoxyoctane	47
40. $\text{CH}_3[\text{CH}_2]_2\text{O}[\text{CH}_2]_6\text{CH}_3$	Propyl heptyl ether	1-Propoxyheptane	48
41. $\text{CH}_3[\text{CH}_2]_3\text{O}[\text{CH}_2]_5\text{CH}_3$	Butyl hexyl ether	1-Butoxyhexane	49
42. $(\text{CH}_3[\text{CH}_2]_4)_2\text{O}$	Dipentyl ether	1,1'-Oxybis(pentane) 1-Pentoxypentane Diamyl ether Pentyl ether Amyl ether	50
43. $(\text{CH}_3)_2\text{CH}[\text{CH}_2]_2\text{O}[\text{CH}_2]_2\text{CH}(\text{CH}_3)_2$	Diisopentyl ether	1,1'-Oxybis(3-methylbutane) Bis(3-methylbutyl) ether Diisoamyl ether Isopentyl ether Isoamyl ether	51

C₁₁ DIALKYL ETHERS

44. $\text{CH}_3\text{O}[\text{CH}_2]_9\text{CH}_3$	Methyl decyl ether	1-Methoxydecane	52
45. $\text{CH}_3\text{CH}_2\text{O}[\text{CH}_2]_8\text{CH}_3$	Ethyl nonyl ether	1-Ethoxynonane	53
46. $\text{CH}_3[\text{CH}_2]_2\text{O}[\text{CH}_2]_7\text{CH}_3$	Propyl octyl ether	1-Propoxyoctane	54
47. $\text{CH}_3[\text{CH}_2]_3\text{O}[\text{CH}_2]_6\text{CH}_3$	Butyl heptyl ether	1-Butoxyheptane	55
48. $\text{CH}_3[\text{CH}_2]_4\text{O}[\text{CH}_2]_5\text{CH}_3$	Pentyl hexyl ether	1-Pentoxyhexane	56

C₁₂ DIALKYL ETHERS

49. $\text{CH}_3\text{CH}_2\text{O}[\text{CH}_2]_9\text{CH}_3$	Ethyl decyl ether	1-Ethoxydecane	57
50. $\text{CH}_3[\text{CH}_2]_2\text{O}[\text{CH}_2]_8\text{CH}_3$	Propyl nonyl ether	1-Propoxynonane	58
51. $\text{CH}_3[\text{CH}_2]_3\text{O}[\text{CH}_2]_7\text{CH}_3$	Butyl octyl ether	1-Butoxyoctane	59
52. $\text{CH}_3[\text{CH}_2]_4\text{O}[\text{CH}_2]_6\text{CH}_3$	Pentyl heptyl ether	1-Pentoxyheptane	60

Formula	Name	Alternative Name(s)	
53. $(\text{CH}_3[\text{CH}_2]_5)_2\text{O}$	Dihexyl ether	1,1'-Oxybis(hexane) 1-Hexoxyhexane Hexyl ether	61
C₁₃ and C₁₄ DIALKYL ETHERS			
54. $\text{CH}_3[\text{CH}_2]_2\text{O}[\text{CH}_2]_9\text{CH}_3$	Propyl decyl ether	1-Propoxydecane	62
55. $\text{CH}_3[\text{CH}_2]_3\text{O}[\text{CH}_2]_8\text{CH}_3$	Butyl nonyl ether	1-Butoxynonane	63
56. $\text{CH}_3[\text{CH}_2]_4\text{O}[\text{CH}_2]_7\text{CH}_3$	Pentyl octyl ether	1-Pentoxyoctane	64
57. $\text{CH}_3[\text{CH}_2]_5\text{O}[\text{CH}_2]_6\text{CH}_3$	Hexyl heptyl ether	1-Hexoxyheptane	65
58. $\text{CH}_3[\text{CH}_2]_3\text{O}[\text{CH}_2]_9\text{CH}_3$	Butyl decyl ether	1-Butoxydecane	66
59. $\text{CH}_3[\text{CH}_2]_4\text{O}[\text{CH}_2]_8\text{CH}_3$	Pentyl nonyl ether	1-Pentoxynonane	67
60. $\text{CH}_3[\text{CH}_2]_5\text{O}[\text{CH}_2]_7\text{CH}_3$	Hexyl octyl ether	1-Hexoxyoctane	68
61. $(\text{CH}_3[\text{CH}_2]_6)_2\text{O}$	Diheptyl ether	1,1'-Oxybisheptane 1-Heptoxyheptane Heptyl ether	69
C₁₅ and C₁₆ DIALKYL ETHERS			
62. $\text{CH}_3[\text{CH}_2]_4\text{O}[\text{CH}_2]_9\text{CH}_3$	Pentyl decyl ether	1-Pentoxydecane	70
63. $\text{CH}_3[\text{CH}_2]_5\text{O}[\text{CH}_2]_8\text{CH}_3$	Hexyl nonyl ether	1-Hexoxynonane	71
64. $\text{CH}_3[\text{CH}_2]_6\text{O}[\text{CH}_2]_7\text{CH}_3$	Heptyl octyl ether	1-Heptoxyoctane	72
65. $\text{CH}_3[\text{CH}_2]_5\text{O}[\text{CH}_2]_9\text{CH}_3$	Hexyl decyl ether	1-Hexoxydecane	73
66. $\text{CH}_3[\text{CH}_2]_6\text{O}[\text{CH}_2]_8\text{CH}_3$	Heptyl nonyl ether	1-Heptoxynonane	74
67. $(\text{CH}_3[\text{CH}_2]_7)_2\text{O}$	Diocetyl ether	1,1'-Oxybis(octane) 1-Octoxyoctane Octyl ether	75
C₁₇ to C₂₀ DIALKYL ETHERS			
68. $\text{CH}_3[\text{CH}_2]_6\text{O}[\text{CH}_2]_9\text{CH}_3$	Heptyl decyl ether	1-Heptoxydecane	76
69. $\text{CH}_3[\text{CH}_2]_7\text{O}[\text{CH}_2]_8\text{CH}_3$	Octyl nonyl ether	1-Octoxynonane	77
70. $\text{CH}_3[\text{CH}_2]_7\text{O}[\text{CH}_2]_9\text{CH}_3$	Octyl decyl ether	1-Octoxydecane	78
71. $(\text{CH}_3[\text{CH}_2]_8)_2\text{O}$	Dinonyl ether	1,1'-Oxybis(nonane) 1-Nonoxynonane Nonyl ether	79
72. $\text{CH}_3[\text{CH}_2]_8\text{O}[\text{CH}_2]_9\text{CH}_3$	Nonyl decyl ether	1-Nonoxydecane	80
73. $(\text{CH}_3[\text{CH}_2]_9)_2\text{O}$	Didecyl ether	1,1'-Oxybis(decane) 1-Decoxydecane Decyl ether	81

THERMAL CONDUCTIVITY OF LIQUIDS: ALIPHATIC ETHERS

1. INTRODUCTION

This Item presents values of thermal conductivity at saturation pressure, in tabular form, for liquid straight and branched chain aliphatic ethers.

The data on which these recommended values of thermal conductivity are based are the most reliable available and the temperature range covered is from the melting temperature to approximately 0.9 of the critical temperature. Quantities are expressed in SI units and conversion factors to other units are provided in Section 3.

Section 4 describes the procedure used to obtain the values of thermal conductivity presented and indicates the effect of pressure. Section 5 gives an explanation of the Tables and indicates the uncertainties in the values presented in them.

References to sources of supplementary information are given in Section 6. The data sources for each particular compound are listed on the appropriate data sheet.

2. NOTATION AND UNITS

The SI unit of thermal conductivity is the watt per metre kelvin (W/m K). A convenient submultiple SI unit for the range of thermal conductivity in this Item is the milliwatt per metre kelvin (mW/m K); hence that is the unit adopted here.

A	constant for each liquid in Equation (4.2)	mW/m K
A'	constant for each liquid in Equation (4.1)	mW/m K
B'	non-dimensional constant for each liquid in Equation (4.1)	–
B, C, D	non-dimensional constants for each liquid in Equation (4.2)	–
p	pressure	N/m ² (Pa)
T	kelvin temperature	K
t	Celsius temperature, $T - 273.15$	°C
λ	thermal conductivity	mW/m K

Subscripts

c	denotes value at the critical point
p	denotes value at pressure p
r	denotes reduced quantity, <i>e.g.</i> $T_r = T/T_c$.

3. CONVERSION FACTORS

$$\begin{aligned}
 1 \text{ mW/m K} &= 0.8598 \times 10^{-3} \text{ kcal/m h } ^\circ\text{C}^* \\
 &= 2.3885 \times 10^{-6} \text{ cal/cm s } ^\circ\text{C}^* \\
 &= 0.5778 \times 10^{-3} \text{ Chu/ft h } ^\circ\text{C}^* \\
 &= 0.5778 \times 10^{-3} \text{ Btu/ft h } ^\circ\text{F}^* \\
 &= 6.9335 \times 10^{-3} \text{ Btu in/ft}^2 \text{ h } ^\circ\text{F}^*
 \end{aligned}$$

$$\begin{aligned}
 10^5 \text{ N/m}^2 &= 1 \text{ bar} \\
 &= 14.5038 \text{ lbf/in}^2 \\
 &= 1.0197 \text{ kgf/cm}^2 \\
 &= 0.9869 \text{ atm} \\
 &= 750.062 \text{ mmHg.}
 \end{aligned}$$

* The values used for the calorie and British Thermal Unit are International Table values.

4. THERMAL CONDUCTIVITY

4.1 Thermal Conductivity at Saturation Pressure

In Reference 2 Riedel showed that the experimental data for the thermal conductivity of normal (that is unassociated) liquids along the saturation line could be represented by the equation:

$$\lambda = A'[1 + (20/3)(1 - T_r)^{2/3}].$$

For the liquids considered in this Item a better representation of the data is obtained, over a wide temperature range, from the modified equation which was used in some earlier ESDU Items:

$$\lambda = A'[1 + B'(1 - T_r)^{2/3}]. \quad (4.1)$$

The range of applicability of Equation (4.1) is limited for most compounds; recent data from several sources show that there may be marked deviations in the regions of the triple point and the critical point from extrapolations of Equation (4.1) fitted in the intermediate region.

For the liquids considered in this Item a good representation of the data* between the melting temperature and $T_r = 0.9$ is obtained from the equation:

$$\lambda = A[1 + B(1 - T_r)^{1/3} + C(1 - T_r)^{2/3} + D(1 - T_r)]. \quad (4.2)$$

Measurements of thermal conductivity have been made for relatively few liquids at $T_r > 0.9$ and so, because of the uncertain variation of thermal conductivity in the critical region, data are presented only for temperatures up to $T_r = 0.9$. The equation extrapolated in a physically realistic manner to within a few kelvin of the critical point.

The critical temperatures for these compounds have been taken where available from ESDU 95016 (Reference 9); other critical temperatures have been estimated. In this Item, the critical temperatures should be regarded as correlating parameters only and should not be taken as a source of accurate values.

* Experimental data at temperatures below the normal boiling temperature, t_b are often at 1 atm pressure. As indicated in Section 4.2 the difference between values of λ at 1 atm pressure and at saturation pressure below t_b is not significant.

The derived values of A , B , C and D given in Table 7.1 are a correlated set of values giving the best fit to the experimental data, not only as individual compounds but also as members of their chemical series. This method of correlating data for a series of compounds has been described in References 5 and 6. For the aliphatic ethers in this Item, it was found that C and D are directly related to B^* , as was observed for other non-hydrogen-bonded compounds such as the alkanes. Correlated values of the constants A , B , C and D were used to estimate constants for the majority of the liquids, for which no experimental data exist. Using these values with the values of T_c given in Table 7.1, values of λ in mW/m K have been calculated for each compound from Equation (4.2) and are presented in the data sheets.

4.2 Effect of Pressure

At temperatures up to the normal boiling point, the effect of pressure from the saturation pressure to $50 \times 10^5 \text{ N/m}^2$ (up to 50 atm) is to increase the thermal conductivity by approximately 1 per cent and, for most practical purposes, values at saturation pressure may be taken as equal to those at atmospheric pressure.

Reference 1 gives measurements of thermal conductivity for a number of liquids up to $12\,000 \times 10^5 \text{ N/m}^2$ ($\approx 12\,000 \text{ atm}$) at 30°C and 75°C . A generalised correlation of these results is given in Reference 3, but a knowledge of the critical pressure of the substance is required for its use.

For pressures up to $500 \times 10^5 \text{ N/m}^2$ ($\approx 500 \text{ atm}$) between the melting temperature and the normal boiling point a very approximate relationship:

$$\lambda_p/\lambda \approx 1 + 0.2p \times 10^{-8}, \quad (4.3)$$

may be used where λ_p is the thermal conductivity at pressure p and λ is the thermal conductivity at a pressure of 10^5 N/m^2 ($\approx 1 \text{ atm}$), both at the same temperature.

5. EXPLANATION OF TABLES

The constants of Equation (4.2) are given in Table 7.1 and on the data sheets. Values of the thermal conductivity are given in the data sheets at 10 kelvin intervals in K and $^\circ\text{C}$, from within 10 kelvin of the melting temperature, or an appropriate starting temperature where the melting temperature is unknown, to a temperature corresponding with $T_r \approx 0.9$.

The sources are given in the data sheets and extrapolated values are indicated in parentheses.

For uniformity and ease of interpolation the data are presented and can be read to more significant digits than is warranted by their estimated accuracy.

The experimental data from the most reliable individual sources have a repeatability of about ± 1 per cent although differences in technique used by different workers (and possibly also in the purity of samples) can increase the uncertainty in the absolute values to about ± 2 per cent. However, such reliable data are not available for all the compounds considered, nor over the whole temperature range covered. Although it is considered that the correlation procedures adopted keep the errors in the values presented to a minimum, the user should in general allow for an uncertainty of ± 5 per cent unless the value in the data sheet is truncated to a whole number. Where whole numbers are given the uncertainty increases to ± 10 per cent.

Some fluids have poor thermal stability coupled with a high critical temperature. Values have been tabulated for all fluids up to $T_r \approx 0.9$ but many of these fluids will decompose at elevated temperatures. As most

* $C = 1 - 3B$ and $D = 3B$.

compounds will decompose rapidly at temperatures above about 300 °C, uncertainties of greater than ± 10 per cent may occur for temperatures ≥ 573 K.

6. REFERENCES

The references given are recommended sources of information supplementary to that in this Item.

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7. TABLES

TABLE 7.1 Constants for Equation (4.2)

Compound	T_c	A	B	C	D	Range of Applicability °C	
	K	mW/m K					
1. Dimethyl ether	400.	78.5	2.60	-6.80	7.80	-140	to 90
2. Methyl ethyl ether	437.85	66.2	2.40	-6.20	7.20	-150	to 130
3. Methyl propyl ether	476.25	61.7	2.20	-5.60	6.60	-150	to 160
4. Methyl isopropyl ether	464.48	61.1	1.90	-4.70	5.70	-150	to 150
5. Diethyl ether	466.65	61.7	2.20	-5.60	6.60	-120	to 150
6. Methyl butyl ether	512.75	58.8	2.00	-5.00	6.00	-120	to 200
7. Methyl <i>sec</i> -butyl ether	500.	58.1	1.70	-4.10	5.10	-120	to 180
8. Methyl isobutyl ether	499.	58.1	1.70	-4.10	5.10	-120	to 180
9. Methyl <i>tert</i> -butyl ether	497.1	51.8	1.70	-4.10	5.10	-120	to 180
10. Ethyl propyl ether	500.4	58.8	2.00	-5.00	6.00	-130	to 190
11. Ethyl isopropyl ether	486.	58.1	1.70	-4.10	5.10	-130	to 170
12. Methyl pentyl ether	546.5	58.2	1.80	-4.40	5.40	-130	to 230
13. Methyl 1-methylbutyl ether	535.	56.0	1.60	-3.80	4.80	-130	to 220
14. Methyl 2-methylbutyl ether	534.	56.0	1.60	-3.80	4.80	-130	to 220
15. Methyl isopentyl ether	532.	56.0	1.60	-3.80	4.80	-130	to 210
16. Methyl <i>tert</i> -pentyl ether	530.	51.1	1.60	-3.80	4.80	-130	to 210
17. Ethyl butyl ether	533.	58.2	1.80	-4.40	5.40	-100	to 210
18. Ethyl <i>sec</i> -butyl ether	520.	56.0	1.60	-3.80	4.80	-100	to 200
19. Ethyl isobutyl ether	522.	56.0	1.60	-3.80	4.80	-100	to 200
20. Ethyl <i>tert</i> -butyl ether	514.	51.1	1.60	-3.80	4.80	-100	to 200
21. Dipropyl ether	530.6	58.2	1.80	-4.40	5.40	-120	to 210
22. Propyl isopropyl ether	517.	56.0	1.60	-3.80	4.80	-120	to 200
23. Diisopropyl ether	500.32	56.1	1.30	-2.90	3.90	-120	to 190
24. Methyl hexyl ether	575.	57.5	1.65	-3.95	4.95	-130	to 250
25. Ethyl pentyl ether	563.	57.5	1.65	-3.95	4.95	-130	to 240
26. Propyl butyl ether	559.	57.5	1.65	-3.95	4.95	-130	to 240
27. Methyl heptyl ether	600.	56.1	1.65	-3.95	4.95	-130	to 270
28. Ethyl hexyl ether	589.	57.4	1.50	-3.50	4.50	-130	to 270
29. Propyl pentyl ether	585.	57.4	1.50	-3.50	4.50	-130	to 260
30. Dibutyl ether	583.	57.4	1.50	-3.50	4.50	-100	to 260
31. Disec-butyl ether	564.	54.2	1.10	-2.30	3.30	-100	to 240
32. Diisobutyl ether	561.	54.2	1.10	-2.30	3.30	-100	to 240
33. Ditert-butyl ether	550.	48.9	1.10	-2.30	3.30	-100	to 230
34. Methyl octyl ether	622.	57.7	1.40	-3.20	4.20	-130	to 290
35. Ethyl heptyl ether	613.	57.7	1.40	-3.20	4.20	-130	to 290
36. Propyl hexyl ether	609.	57.7	1.40	-3.20	4.20	-130	to 280
37. Butyl pentyl ether	607.	57.7	1.40	-3.20	4.20	-100	to 280

TABLE 7.1 Constants for Equation (4.2) (Continued)

Compound	T_c	A	B	C	D	Range of Applicability °C	
	K	mW/m K					
38. Methyl nonyl ether	622.	58.7	1.30	-2.90	3.90	-130	to 290
39. Ethyl octyl ether	635.	58.7	1.30	-2.90	3.90	10	to 310
40. Propyl heptyl ether	631.	58.7	1.30	-2.90	3.90	-130	to 300
41. Butyl hexyl ether	629.	58.7	1.30	-2.90	3.90	-100	to 300
42. Dipentyl ether	628.	58.7	1.30	-2.90	3.90	-70	to 300
43. Diisopentyl ether	616.	56.6	0.90	-1.70	2.70	-100	to 290
44. Methyl decyl ether	660.	60.1	1.20	-2.60	3.60	-130	to 330
45. Ethyl nonyl ether	654.	60.1	1.20	-2.60	3.60	-100	to 320
46. Propyl octyl ether	651.	60.1	1.20	-2.60	3.60	-130	to 320
47. Butyl heptyl ether	649.	60.1	1.20	-2.60	3.60	-100	to 320
48. Pentyl hexyl ether	648.	60.1	1.20	-2.60	3.60	-100	to 320
49. Ethyl decyl ether	671.	61.1	1.10	-2.30	3.30	-100	to 340
50. Propyl nonyl ether	669.	61.1	1.10	-2.30	3.30	-130	to 340
51. Butyl octyl ether	667.	61.1	1.10	-2.30	3.30	-100	to 340
52. Pentyl heptyl ether	666.	61.1	1.10	-2.30	3.30	-100	to 330
53. Dihexyl ether	666.	61.1	1.10	-2.30	3.30	-40	to 330
54. Propyl decyl ether	685.	62.7	1.00	-2.00	3.00	-130	to 350
55. Butyl nonyl ether	683.	62.7	1.00	-2.00	3.00	-100	to 350
56. Pentyl octyl ether	683.	62.7	1.00	-2.00	3.00	-100	to 350
57. Hexyl heptyl ether	683.	62.7	1.00	-2.00	3.00	-50	to 350
58. Butyl decyl ether	700.	63.7	0.95	-1.85	2.85	-100	to 360
59. Pentyl nonyl ether	699.	63.7	0.95	-1.85	2.85	-100	to 360
60. Hexyl octyl ether	699.	63.7	0.95	-1.85	2.85	-50	to 360
61. Diheptyl ether	699.	63.7	0.95	-1.85	2.85	-30	to 360
62. Pentyl decyl ether	713.	64.8	0.90	-1.70	2.70	0	to 380
63. Hexyl nonyl ether	713.	64.8	0.90	-1.70	2.70	-50	to 380
64. Heptyl octyl ether	713.	64.8	0.90	-1.70	2.70	-50	to 380
65. Hexyl decyl ether	726.	65.4	0.85	-1.55	2.55	-50	to 390
66. Heptyl nonyl ether	726.	65.4	0.85	-1.55	2.55	-30	to 390
67. Dioctyl ether	726.	65.4	0.85	-1.55	2.55	-10	to 390
68. Heptyl decyl ether	726.	65.9	0.85	-1.55	2.55	-30	to 390
69. Octyl nonyl ether	738.	65.9	0.85	-1.55	2.55	0	to 400
70. Octyl decyl ether	749.	67.1	0.80	-1.40	2.40	0	to 410
71. Dinonyl ether	749.	67.1	0.80	-1.40	2.40	0	to 410
72. Nonyl decyl ether	760.	67.6	0.80	-1.40	2.40	0	to 420
73. Didecyl ether	770.	68.2	0.80	-1.40	2.40	10	to 430

(CH₃)₂O DIMETHYL ETHER (METHOXYMETHANE, OXYBISMETHANE, METHYL ETHER)

$$\lambda = A[1 + B(1 - T_r)^{1/3} + C(1 - T_r)^{2/3} + D(1 - T_r)]$$

where

λ = thermal conductivity at saturation pressure (mW/m K)

$$T_r = T/T_c, \quad T = \text{temperature (K)}$$

$$T_c = 400. \text{ K}$$

$$A = 78.5, \quad B = 2.60, \quad C = -6.80, \quad D = 7.80$$

T K	λ mW/m K	T K	λ mW/m K	t °C	λ mW/m K	t °C	λ mW/m K
130	(260.)	250	(178.)	-140	(258.)	-20	(176.)
140	(253.)	260	(172.)	-130	(250.)	-10	(170.)
150	(245.)	270	(165.)	-120	(243.)	0	(164.)
160	(238.)	280	(160.)	-110	(236.)	10	(158.)
170	(231.)	290	(154.)	-100	(229.)	20	(152.)
180	(224.)	300	(148.)	-90	(222.)	30	(147.)
190	(217.)	310	(143.)	-80	(215.)	40	(141.)
200	(210.)	320	(138.)	-70	(208.)	50	(136.)
210	(204.)	330	(133.)	-60	(202.)	60	(131.)
220	(197.)	340	(128.)	-50	(195.)	70	(127.)
230	(190.)	350	(124.)	-40	(188.)	80	(122.)
240	(184.)	360	(119.)	-30	(182.)	90	(118.)

CH₃OCH₂CH₃ METHYL ETHYL ETHER (METHOXYETHANE)

$$\lambda = A[1 + B(1 - T_r)^{1/3} + C(1 - T_r)^{2/3} + D(1 - T_r)]$$

where

λ = thermal conductivity at saturation pressure (mW/m K)

$$T_r = T/T_c, \quad T = \text{temperature (K)}$$

$$T_c = 437.85 \text{ K}$$

$$A = 66.2, \quad B = 2.40, \quad C = -6.20, \quad D = 7.20$$

T K	λ mW/m K	T K	λ mW/m K	t °C	λ mW/m K	t °C	λ mW/m K
120	(223.)	270	(148.)	-150	(222.)	0	(146.)
130	(218.)	280	(143.)	-140	(216.)	10	(142.)
140	(213.)	290	(139.)	-130	(211.)	20	(137.)
150	(207.)	300	(134.)	-120	(206.)	30	(133.)
160	(202.)	310	(130.)	-110	(200.)	40	(129.)
170	(197.)	320	(126.)	-100	(195.)	50	(125.)
180	(192.)	330	(122.)	-90	(190.)	60	(121.)
190	(187.)	340	(118.)	-80	(185.)	70	(117.)
200	(182.)	350	(114.)	-70	(180.)	80	(113.)
210	(176.)	360	(111.)	-60	(175.)	90	(109.)
220	(172.)	370	(107.)	-50	(170.)	100	(106.)
230	(167.)	380	(104.)	-40	(165.)	110	(103.)
240	(162.)	390	(100.)	-30	(160.)	120	(99.)
250	(157.)	400	(97.)	-20	(156.)	130	(96.)
260	(152.)			-10	(151.)		

CH₃O[CH₂]₂CH₃ METHYL PROPYL ETHER (1-METHOXYPROPANE)

$$\lambda = A[1 + B(1 - T_r)^{1/3} + C(1 - T_r)^{2/3} + D(1 - T_r)]$$

where

λ = thermal conductivity at saturation pressure (mW/m K)

$T_r = T/T_c$, T = temperature (K)

$T_c = 476.25$ K

$A = 61.7$, $B = 2.20$, $C = -5.60$, $D = 6.60$

T K	λ mW/m K	T K	λ mW/m K	t °C	λ mW/m K	t °C	λ mW/m K
120	(205.)	280	(139.2)	-150	(203.)	10	(138.0)
130	(200.)	290	(135.4)	-140	(199.)	20	(134.3)
140	(196.)	300	(131.8)	-130	(195.)	30	(130.6)
150	(192.)	310	(128.1)	-120	(190.)	40	(127.0)
160	(188.)	320	(124.6)	-110	(186.)	50	(123.5)
170	(183.)	330	(121.1)	-100	(182.)	60	(120.0)
180	(179.)	340	(117.6)	-90	(178.)	70	(116.6)
190	(175.)	350	(114.3)	-80	(174.)	80	(113.2)
200	(171.)	360	(111.0)	-70	(170.)	90	(110.0)
210	(167.)	370	(107.8)	-60	(165.)	100	(106.8)
220	(163.)	380	(105.)	-50	(161.4)	110	(104.)
230	(158.6)	390	(102.)	-40	(157.4)	120	(101.)
240	(154.6)	400	(99.)	-30	(153.4)	130	(98.)
250	(150.7)	410	(96.)	-20	(149.5)	140	(95.)
260	(146.8)	420	(93.)	-10	(145.6)	150	(92.)
270	(143.0)	430	(91.)	0	(141.8)	160	(90.)

CH₃OCH(CH₃)₂ METHYL ISOPROPYL ETHER
(2-METHOXYPROPANE, METHYL 1-METHYLETHYL ETHER)

$$\lambda = A[1 + B(1 - T_r)^{1/3} + C(1 - T_r)^{2/3} + D(1 - T_r)]$$

where

λ = thermal conductivity at saturation pressure (mW/m K)

$T_r = T/T_c$, T = temperature (K)

$T_c = 464.48$ K

$A = 61.1$, $B = 1.90$, $C = -4.70$, $D = 5.70$

T K	λ mW/m K	T K	λ mW/m K	t °C	λ mW/m K	t °C	λ mW/m K
120	(189.)	280	(130.)	-150	(188.)	10	(129.)
130	(185.)	290	(126.)	-140	(184.)	20	(125.)
140	(181.)	300	(123.)	-130	(180.)	30	(122.)
150	(177.)	310	(120.)	-120	(176.)	40	(118.)
160	(174.)	320	(116.)	-110	(172.)	50	(115.)
170	(170.)	330	(113.)	-100	(168.)	60	(112.)
180	(166.)	340	(110.)	-90	(165.)	70	(109.)
190	(162.)	350	(107.)	-80	(161.)	80	(106.)
200	(158.)	360	(104.)	-70	(157.)	90	(103.)
210	(155.)	370	(101.)	-60	(153.)	100	(100.)
220	(151.)	380	(98.)	-50	(150.)	110	(97.)
230	(147.)	390	(95.)	-40	(146.)	120	(94.)
240	(144.)	400	(93.)	-30	(143.)	130	(92.)
250	(140.)	410	(90.)	-20	(139.)	140	(89.)
260	(137.)	420	(87.)	-10	(135.)	150	(87.)
270	(133.)			0	(132.)		

(CH₃CH₂)₂O DIETHYL ETHER (ETHOXYETHANE, 1,1'-OXYBISETHANE, ETHYL ETHER)

$$\lambda = A[1 + B(1 - T_r)^{1/3} + C(1 - T_r)^{2/3} + D(1 - T_r)]$$

where

λ = thermal conductivity at saturation pressure (mW/m K)

$T_r = T/T_c$, T = temperature (K)

$T_c = 466.65$ K

$A = 61.7$, $B = 2.20$, $C = -5.60$, $D = 6.60$

T K	λ mW/m K	T K	λ mW/m K	t °C	λ mW/m K	t °C	λ mW/m K
150	(190.)	290	133.2	-120	(189.)	20	132.1
160	(186.1)	300	129.5	-110	(184.8)	30	128.3
170	(181.8)	310	125.8	-100	(180.5)	40	124.7
180	(177.6)	320	122.2	-90	176.2	50	121.1
190	173.3	330	118.7	-80	172.0	60	117.6
200	169.1	340	115.3	-70	167.8	70	114.2
210	164.9	350	111.9	-60	163.6	80	110.8
220	160.8	360	108.6	-50	159.5	90	107.6
230	156.7	370	105.4	-40	155.5	100	104.4
240	152.7	380	102.3	-30	151.4	110	101.3
250	148.7	390	99.3	-20	147.5	120	98.4
260	144.8	400	96.4	-10	143.5	130	95.5
270	140.9	410	94.	0	139.6	140	93.
280	137.0	420	91.	10	135.8	150	90.

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CH₃O[CH₂]₃CH₃ METHYL BUTYL ETHER (1-METHOXYBUTANE)

$$\lambda = A[1 + B(1 - T_r)^{1/3} + C(1 - T_r)^{2/3} + D(1 - T_r)]$$

where

λ = thermal conductivity at saturation pressure (mW/m K)

$$T_r = T/T_c, \quad T = \text{temperature (K)}$$

$$T_c = 512.75 \text{ K}$$

$$A = 58.8, \quad B = 2.00, \quad C = -5.00, \quad D = 6.00$$

T K	λ mW/m K	T K	λ mW/m K	t °C	λ mW/m K	t °C	λ mW/m K
150	(180.)	320	(123.2)	-120	(179.)	50	(122.2)
160	(176.)	330	(120.1)	-110	(175.)	60	(119.2)
170	(173.)	340	(117.1)	-100	(172.)	70	(116.2)
180	(169.)	350	(114.2)	-90	(168.)	80	(113.3)
190	(166.)	360	(111.3)	-80	(165.)	90	(110.4)
200	(162.)	370	(108.5)	-70	(161.)	100	(107.6)
210	(159.)	380	(106.)	-60	(158.)	110	(105.)
220	(155.)	390	(103.)	-50	(154.4)	120	(102.)
230	(152.1)	400	(100.)	-40	(151.0)	130	(99.)
240	(148.7)	410	(98.)	-30	(147.7)	140	(97.)
250	(145.4)	420	(95.)	-20	(144.4)	150	(94.)
260	(142.1)	430	(93.)	-10	(141.1)	160	(92.)
270	(138.9)	440	(90.)	0	(137.9)	170	(89.)
280	(135.7)	450	(88.)	10	(134.7)	180	(87.)
290	(132.5)	460	(86.)	20	(131.5)	190	(85.)
300	(129.3)	470	(83.)	30	(128.4)	200	(83.)
310	(126.2)			40	(125.3)		

CH₃OCH(CH₃)CH₂CH₃ METHYL *sec*-BUTYL ETHER
(2-METHOXYBUTANE, METHYL 1-METHYLPROPYL ETHER)

$$\lambda = A[1 + B(1 - T_r)^{1/3} + C(1 - T_r)^{2/3} + D(1 - T_r)]$$

where

λ = thermal conductivity at saturation pressure (mW/m K)

$T_r = T/T_c$, T = temperature (K)

$T_c = 500. \text{ K}$

$A = 58.1$, $B = 1.70$, $C = -4.10$, $D = 5.10$

T K	λ mW/m K	T K	λ mW/m K	t °C	λ mW/m K	t °C	λ mW/m K
150	(165.)	310	(117.)	-120	(164.)	40	(116.)
160	(162.)	320	(114.)	-110	(161.)	50	(114.)
170	(159.)	330	(112.)	-100	(158.)	60	(111.)
180	(156.)	340	(109.)	-90	(155.)	70	(108.)
190	(153.)	350	(106.)	-80	(152.)	80	(106.)
200	(150.)	360	(104.)	-70	(149.)	90	(103.)
210	(147.)	370	(101.)	-60	(146.)	100	(100.)
220	(144.)	380	(99.)	-50	(143.)	110	(98.)
230	(141.)	390	(96.)	-40	(140.)	120	(95.)
240	(138.)	400	(94.)	-30	(137.)	130	(93.)
250	(135.)	410	(91.)	-20	(134.)	140	(91.)
260	(132.)	420	(89.)	-10	(131.)	150	(88.)
270	(129.)	430	(87.)	0	(128.)	160	(86.)
280	(126.)	440	(84.)	10	(125.)	170	(84.)
290	(123.)	450	(82.)	20	(122.)	180	(82.)
300	(120.)			30	(119.)		

CH₃OCH₂CH(CH₃)₂ METHYL ISOBUTYL ETHER
(1-METHOXY-2-METHYLPROPANE, METHYL 2-METHYLPROPYL ETHER)

$$\lambda = A[1 + B(1 - T_r)^{1/3} + C(1 - T_r)^{2/3} + D(1 - T_r)]$$

where

λ = thermal conductivity at saturation pressure (mW/m K)

$T_r = T/T_c$, T = temperature (K)

$T_c = 499. \text{ K}$

$A = 58.1$, $B = 1.70$, $C = -4.10$, $D = 5.10$

T K	λ mW/m K	T K	λ mW/m K	t °C	λ mW/m K	t °C	λ mW/m K
150	(165.)	310	(117.)	-120	(164.)	40	(116.)
160	(162.)	320	(114.)	-110	(161.)	50	(113.)
170	(159.)	330	(112.)	-100	(158.)	60	(111.)
180	(156.)	340	(109.)	-90	(155.)	70	(108.)
190	(153.)	350	(106.)	-80	(152.)	80	(105.)
200	(150.)	360	(104.)	-70	(149.)	90	(103.)
210	(147.)	370	(101.)	-60	(146.)	100	(100.)
220	(143.)	380	(98.)	-50	(143.)	110	(98.)
230	(140.)	390	(96.)	-40	(139.)	120	(95.)
240	(137.)	400	(93.)	-30	(136.)	130	(93.)
250	(134.)	410	(91.)	-20	(134.)	140	(90.)
260	(131.)	420	(89.)	-10	(131.)	150	(88.)
270	(129.)	430	(86.)	0	(128.)	160	(86.)
280	(126.)	440	(84.)	10	(125.)	170	(84.)
290	(123.)	450	(82.)	20	(122.)	180	(81.)
300	(120.)			30	(119.)		

CH₃OC(CH₃)₃ METHYL *tert*-BUTYL ETHER

(2-METHOXY-2-METHYLPROPANE, METHYL 1,1-DIMETHYLETHYL ETHER, MtBE)

$$\lambda = A[1 + B(1 - T_r)^{1/3} + C(1 - T_r)^{2/3} + D(1 - T_r)]$$

where

λ = thermal conductivity at saturation pressure (mW/m K)

$T_r = T/T_c$, T = temperature (K)

$T_c = 497.1$ K

$A = 51.8$, $B = 1.70$, $C = -4.10$, $D = 5.10$

T K	λ mW/m K	T K	λ mW/m K	t °C	λ mW/m K	t °C	λ mW/m K
150	(147.)	310	104.1	-120	(146.)	40	103.3
160	(144.4)	320	101.6	-110	(143.5)	50	100.8
170	(141.6)	330	99.2	-100	(140.7)	60	98.4
180	(138.7)	340	96.7	-90	(137.9)	70	96.0
190	(136.0)	350	94.3	-80	(135.1)	80	93.6
200	(133.2)	360	92.0	-70	(132.3)	90	91.3
210	(130.4)	370	89.7	-60	(129.6)	100	89.0
220	(127.7)	380	87.4	-50	(126.8)	110	86.7
230	(125.0)	390	85.2	-40	(124.1)	120	84.5
240	(122.3)	400	83.0	-30	(121.4)	130	82.3
250	(119.6)	410	80.9	-20	(118.8)	140	80.2
260	(117.0)	420	78.8	-10	(116.1)	150	78.1
270	(114.3)	430	76.7	0	(113.5)	160	76.1
280	(111.7)	440	74.8	10	(110.9)	170	74.2
290	(109.2)	450	72.8	20	108.4	180	72.2
300	106.6			30	105.8		

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CH₃CH₂O[CH₂]₂CH₃ ETHYL PROPYL ETHER (1-ETHOXYPROPANE)

$$\lambda = A[1 + B(1 - T_r)^{1/3} + C(1 - T_r)^{2/3} + D(1 - T_r)]$$

where

λ = thermal conductivity at saturation pressure (mW/m K)

$T_r = T/T_c$, T = temperature (K)

$T_c = 500.4$ K

$A = 58.8$, $B = 2.00$, $C = -5.00$, $D = 6.00$

T K	λ mW/m K	T K	λ mW/m K	t °C	λ mW/m K	t °C	λ mW/m K
140	(182.)	310	(123.9)	-130	(181.)	40	(122.9)
150	(178.)	320	(120.8)	-120	(177.)	50	(119.8)
160	(175.)	330	(117.7)	-110	(174.)	60	(116.7)
170	(171.)	340	(114.7)	-100	(170.)	70	(113.7)
180	(168.)	350	(111.7)	-90	(167.)	80	(110.8)
190	(164.)	360	(108.8)	-80	(163.)	90	(107.9)
200	(161.)	370	(105.9)	-70	(159.)	100	(105.0)
210	(157.)	380	(103.1)	-60	(156.)	110	(102.2)
220	(154.)	390	(100.4)	-50	(152.5)	120	(99.5)
230	(150.2)	400	(97.7)	-40	(149.1)	130	(96.8)
240	(146.8)	410	(95.1)	-30	(145.7)	140	(94.3)
250	(143.4)	420	(92.5)	-20	(142.3)	150	(91.7)
260	(140.1)	430	(90.)	-10	(139.0)	160	(89.)
270	(136.7)	440	(88.)	0	(135.7)	170	(87.)
280	(133.5)	450	(85.)	10	(132.4)	180	(85.)
290	(130.2)	460	(83.)	20	(129.2)	190	(83.)
300	(127.0)			30	(126.0)		

CH₃CH₂OCH(CH₃)₂ ETHYL ISOPROPYL ETHER
(2-ETHOXYPROPANE, ETHYL 1-METHYLETHYL ETHER)

$$\lambda = A[1 + B(1 - T_r)^{1/3} + C(1 - T_r)^{2/3} + D(1 - T_r)]$$

where

λ = thermal conductivity at saturation pressure (mW/m K)

$T_r = T/T_c$, T = temperature (K)

$T_c = 486. \text{ K}$

$A = 58.1$, $B = 1.70$, $C = -4.10$, $D = 5.10$

T K	λ mW/m K	T K	λ mW/m K	t °C	λ mW/m K	t °C	λ mW/m K
140	(167.)	300	(118.)	-130	(166.)	30	(117.)
150	(164.)	310	(115.)	-120	(163.)	40	(114.)
160	(161.)	320	(112.)	-110	(160.)	50	(111.)
170	(158.)	330	(109.)	-100	(157.)	60	(108.)
180	(154.)	340	(106.)	-90	(153.)	70	(106.)
190	(151.)	350	(104.)	-80	(150.)	80	(103.)
200	(148.)	360	(101.)	-70	(147.)	90	(100.)
210	(145.)	370	(98.)	-60	(144.)	100	(98.)
220	(142.)	380	(96.)	-50	(141.)	110	(95.)
230	(139.)	390	(93.)	-40	(138.)	120	(93.)
240	(136.)	400	(91.)	-30	(135.)	130	(90.)
250	(132.)	410	(89.)	-20	(131.)	140	(88.)
260	(129.)	420	(86.)	-10	(128.)	150	(85.)
270	(126.)	430	(84.)	0	(126.)	160	(83.)
280	(123.)	440	(82.)	10	(123.)	170	(81.)
290	(121.)			20	(120.)		

CH₃O[CH₂]₄CH₃ METHYL PENTYL ETHER (1-METHOXPENTANE)

$$\lambda = A[1 + B(1 - T_r)^{1/3} + C(1 - T_r)^{2/3} + D(1 - T_r)]$$

where

λ = thermal conductivity at saturation pressure (mW/m K)

$T_r = T/T_c$, T = temperature (K)

$T_c = 546.5$ K

$A = 58.2$, $B = 1.80$, $C = -4.40$, $D = 5.40$

T K	λ mW/m K	T K	λ mW/m K	t °C	λ mW/m K	t °C	λ mW/m K
140	(177.)	330	(121.5)	-130	(176.)	60	(120.7)
150	(174.)	340	(118.8)	-120	(173.)	70	(118.0)
160	(171.)	350	(116.2)	-110	(170.)	80	(115.4)
170	(167.)	360	(113.6)	-100	(167.)	90	(112.8)
180	(164.)	370	(111.0)	-90	(164.)	100	(110.2)
190	(161.)	380	(108.5)	-80	(161.)	110	(107.7)
200	(158.)	390	(106.0)	-70	(158.)	120	(105.2)
210	(155.)	400	(103.5)	-60	(155.)	130	(102.8)
220	(153.)	410	(101.1)	-50	(151.6)	140	(100.4)
230	(149.6)	420	(98.7)	-40	(148.7)	150	(98.0)
240	(146.7)	430	(96.)	-30	(145.8)	160	(96.)
250	(143.8)	440	(94.)	-20	(142.9)	170	(93.)
260	(140.9)	450	(92.)	-10	(140.0)	180	(91.)
270	(138.1)	460	(90.)	0	(137.2)	190	(89.)
280	(135.3)	470	(88.)	10	(134.4)	200	(87.)
290	(132.5)	480	(85.)	20	(131.6)	210	(85.)
300	(129.7)	490	(83.)	30	(128.8)	220	(83.)
310	(126.9)	500	(81.)	40	(126.1)	230	(81.)
320	(124.2)			50	(123.4)		

CH₃OCH(CH₃)[CH₂]₂CH₃ METHYL 1-METHYLBUTYL ETHER (2-METHOXPENTANE)

$$\lambda = A[1 + B(1 - T_r)^{1/3} + C(1 - T_r)^{2/3} + D(1 - T_r)]$$

where

λ = thermal conductivity at saturation pressure (mW/m K)

$$T_r = T/T_c, \quad T = \text{temperature (K)}$$

$$T_c = 535. \text{ K}$$

$$A = 56.0, \quad B = 1.60, \quad C = -3.80, \quad D = 4.80$$

T K	λ mW/m K	T K	λ mW/m K	t °C	λ mW/m K	t °C	λ mW/m K
140	(162.)	320	(114.)	-130	(161.)	50	(113.)
150	(159.)	330	(112.)	-120	(158.)	60	(111.)
160	(156.)	340	(109.)	-110	(155.)	70	(109.)
170	(153.)	350	(107.)	-100	(152.)	80	(106.)
180	(151.)	360	(105.)	-90	(150.)	90	(104.)
190	(148.)	370	(102.)	-80	(147.)	100	(102.)
200	(145.)	380	(100.)	-70	(144.)	110	(99.)
210	(143.)	390	(98.)	-60	(142.)	120	(97.)
220	(140.)	400	(95.)	-50	(139.)	130	(95.)
230	(137.)	410	(93.)	-40	(136.)	140	(93.)
240	(135.)	420	(91.)	-30	(134.)	150	(90.)
250	(132.)	430	(89.)	-20	(131.)	160	(88.)
260	(129.)	440	(87.)	-10	(129.)	170	(86.)
270	(127.)	450	(85.)	0	(126.)	180	(84.)
280	(124.)	460	(83.)	10	(123.)	190	(82.)
290	(122.)	470	(81.)	20	(121.)	200	(80.)
300	(119.)	480	(79.)	30	(118.)	210	(78.)
310	(117.)	490	(77.)	40	(116.)	220	(76.)

CH₃OCH₂CH(CH₃)CH₂CH₃ METHYL 2-METHYLBUTYL ETHER
(1-METHOXY-2-METHYLBUTANE, 2-(METHOXYMETHYL)BUTANE)

$$\lambda = A[1 + B(1 - T_r)^{1/3} + C(1 - T_r)^{2/3} + D(1 - T_r)]$$

where

λ = thermal conductivity at saturation pressure (mW/m K)

$$T_r = T/T_c, \quad T = \text{temperature (K)}$$

$$T_c = 534. \text{ K}$$

$$A = 56.0, \quad B = 1.60, \quad C = -3.80, \quad D = 4.80$$

T K	λ mW/m K	T K	λ mW/m K	t °C	λ mW/m K	t °C	λ mW/m K
140	(162.)	320	(114.)	-130	(161.)	50	(113.)
150	(159.)	330	(112.)	-120	(158.)	60	(111.)
160	(156.)	340	(109.)	-110	(155.)	70	(108.)
170	(153.)	350	(107.)	-100	(152.)	80	(106.)
180	(151.)	360	(104.)	-90	(150.)	90	(104.)
190	(148.)	370	(102.)	-80	(147.)	100	(101.)
200	(145.)	380	(100.)	-70	(144.)	110	(99.)
210	(142.)	390	(98.)	-60	(142.)	120	(97.)
220	(140.)	400	(95.)	-50	(139.)	130	(95.)
230	(137.)	410	(93.)	-40	(136.)	140	(92.)
240	(134.)	420	(91.)	-30	(134.)	150	(90.)
250	(132.)	430	(89.)	-20	(131.)	160	(88.)
260	(129.)	440	(87.)	-10	(128.)	170	(86.)
270	(127.)	450	(85.)	0	(126.)	180	(84.)
280	(124.)	460	(83.)	10	(123.)	190	(82.)
290	(122.)	470	(81.)	20	(121.)	200	(80.)
300	(119.)	480	(79.)	30	(118.)	210	(78.)
310	(117.)	490	(77.)	40	(116.)	220	(76.)