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A FINITE DIFFERENCE PROGRAM TO SOLVE THE TRANSIENT HEAT CONDUCTION EQUATION INVOLVING LATENT HEAT IN CYLINDRICAL SYMMETRY

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ABSTRACT

A numerical model has been developed to simulate the transient thermal regime arising from a cylindrically symmetric disturbance in a semi-infinite medium. Heat transfer by radial conduction only is considered and provision is made for a phase change involving latent heat to occur within the medium. The numerical solution to the transient heat conduction equation using the explicit finite difference method is outlined in detail. Some aspects of the computer solution are described.

The program has been used to produce a set of tables giving both temperatures at various distances from the source for a range of dimensionless times and the radial heat flow leaving the source region. Data are tabulated for cases with and without a phase change; in the case of a phase change, tables are given for latent heat densities of 10 and 100 MJ/m^3 and several source and initial temperatures. This is an extended data set, complementing that in Taylor (1978). In both cases, the source disturbance is considered to be either sustained indefinitely or to last for a finite period, after which cooling occurs.

The program finds application in such geophysical problems as the study of the disturbance to the geothermal regime resulting from the drilling of and production from petroleum wells, from buried pipelines and power cables and from underground tunnels. Using the tables gives an "off-the-shelf" solution to the transient thermal regime in many of these applications. As an example, the program is used to calculate theoretical temperature profiles for a Mackenzie Delta well and to point out the thermal advantage of using an insulating annulus through the permafrost.

RÉSUMÉ

Un modèle numérique a été développé afin de simuler le régime thermique transitoire qui résulte de la perturbation produite par une source cylindrique dans un milieu semi-infini. Le programme prend uniquement en considération la transmission de chaleur par conduction radiale et tient compte de la possibilité d'un changement de phase, impliquant une chaleur latente, dans le milieu. La résolution numérique de l'équation de la conduction de chaleur transitoire, utilisant la méthode de différence finie explicite est exposée en détail. Quelques aspects de la solution par ordinateur sont décrits.

On a utilisé le programme pour produire une série de tables qui donnent, et les températures à plusieurs distances de la source pendant une période de temps, et le flux de chaleur radiale qui part de la source. Les données sont classifiées pour des cas avec et sans changement de phase; dans le premier cas, des tables sont présentées pour les densités latentes de 10 et 100 MJ/m^3, pour plusieurs températures de la source et plusieurs températures initiales du milieu. La présente série étendue de tables complète les données de Taylor (1978). Dans les deux cas, la perturbation est considérée, soit comme se prolongeant indéfiniment, soit comme continuant pendant une période définie et suivie par un refroidissement.

Le programme peut être appliqué à des problèmes géophysiques tels que l'étude du bouleversement au régime géothermique découlant du forage et de l'exploitation des puits de pétrole, des pipelines et des lignes de transmission hydroélectrique enfouis, et des passages souterrains. L'emploi des tables permet une solution à portée de la main du régime thermique transitoire rencontré dans

plusieurs de ces applications. Par exemple, on utilise le programme pour calculer des profils théoriques de température d'un puits du delta du Mackenzie et pour montrer les avantages d'un anneau isolant dans le pergélisol.

CONTENTS

ABSTRACT i
RÉSUMÉ ii

1. Introduction 1

2. The method 2

3. Theory 4

3.1 Division of problem space into cells 4
3.2 Cell parameters 5
3.3 Basic properties of the medium 9
3.4 Heat conduction equation 10
3.5 Steady state solution 11
3.6 Unsteady State equation 12
3.7 Replacing partial derivatives by finite differences 13
3.8 Intuitive development of solution 19
3.9 Initial and boundary conditions 21
3.10 Stability and choice of time step 22

4. Computer solution 26

4.1 The computer technique 26

5. Limitations of the program 30

5.1 Effect of ignoring conduction parallel to axis 30
5.2 Effect of other heat transfer mechanisms 31
5.3 Effect of phase change at constant temperature 32

6. Modelling the thermal regime of a Mackenzie Delta well 34

7. Conclusions 37
Acknowledgements 37
Bibliography 38

Tables 40

1. List of Symbols 41
2. Measured and calculated temperatures of a Mackenzie Delta well 42
3. Temperatures calculated supposing use of an insulating annulus for the Mackenzie Delta well 43

Figures 44

1. Division of problem space for numerical solution 45
2. Temperature profiles calculated for a Mackenzie Delta well 46

Appendix A. Tables of Temperature versus Time for a Sustained Source ... 47
Appendix B. Tables of Heat Flow versus Time for a Sustained Source 74
Appendix C. Tables of Temperature versus Time for a source of finite Duration 83
Appendix D. Tables of Heat Flow versus Time for a source of Finite Duration 156

1. Introduction

Knowledge of the transient thermal regime in problems involving cylindrical symmetry is important in many physical applications. The basic problem is represented by the heating and cooling of a large body by heat conduction from a cylinder imbedded internally. In this work, the solution finds application in geophysics in the study of the disturbance to the geothermal regime resulting from the drilling of and production from petroleum wells, from buried pipelines or power cables and from underground tunnels or drifts. A computer program, developed to simulate these situations numerically, has been designed especially to model the disturbed transient regime due to conduction where a phase change with latent heat is involved, such as in a permafrost environment or in a situation where freezing occurs around a chilled pipeline.

This report complements Taylor (1978), treating the theory in detail and presenting a larger data set. Section 2 describes the method of solution and discusses some of the methods other authors have used to include a phase change. A detailed theory appears in section 3 and the numerical method and the computer solution are described in section 4. The model is basically simple and the impact of neglecting more complex phenomena is discussed in section 5. However, the program has met success in duplicating temperature logs over a number of years at a well in the Mackenzie Delta (section 6). The tabulated data are found in Appendices A to D.

2. The Method

A numerical model has been developed to simulate the transient thermal regime arising from a cylindrically symmetric source disturbance in a semi-infinite medium. Heat transfer by radial conduction only is considered and provision is made for a phase change to occur within the medium.

The finite difference calculus is used to solve the problem. This demands that partial derivatives in the heat conduction equation be replaced by their finite difference approximations. Alternately, an intuitive development of the solution is suggested by the symmetric geometry and the need to divide the problem space into cells for numerical calculations.

Following the latter course, we segment the space surrounding the cylinder source into concentric shells of geometrically increasing radii, and consider only a pie-shaped sector of angle one radian (Fig. 1). Then we may solve for each cell in any small time Δt a conceptual equation

(Heat in)-(Heat out) = (Heat stored in cell as temperature change)

If Δt is chosen smaller than the thermal time constant of the problem, the temperature at any time t for a cell can be found by iterating many increments of Δt. The temperatures of the cells will increase or decrease, depending on the nature of the source.

The possibility of a phase change arising during the duration of the disturbance complicates the calculations sufficiently that some authors have ignored it. Such is a reasonable approximation in permafrost areas of very low porosities where there is little difference in physical properties between frozen and unfrozen states and where the latent heat density is relatively

low. Often, the interest in a particular problem is to prevent melting, in which case simplification is achieved by merely predicting the attainment of temperatures above $0^{o}C$, for instance (Lea et al., 1973). Couch et al. (1970) defined a heat capacity unique to the unfrozen and frozen state, with a considerably larger fictitious heat capacity for a small range of temperatures, which represented the latent heat of the phase change over a finite temperature interval. Kliewer (1973), employing an implicit finite difference technique, used program logic to determine occurrence of a phase change, and then held the element at the freezing point until the latent heat budget was satisfied. A similar approach was followed in the explicit finite difference technique used in this work.

Returning to the model developed here, if a phase change occurs in any cell, the program holds the temperature of the cell at the melting or freezing point until heat equal to the latent heat capacity of the cell has been supplied (in melting) or taken away (in freezing). In such a case the conceptual equation for the cell becomes, temporarily,

(Heat in)-(Heat out) = (Heat contributing to latent heat)

until the right hand side of the equation equals the latent heat capacity of the cell. Thereafter, the cell's temperature is allowed to change according to the previous equation. By applying this routine to all cells and iterating over time, the thermal regime of a system in response to any transient source can be described.

3. THEORY

The mathematical foundation of the explicit finite difference method used in this work is developed in this section, expanding on the theory given in Taylor (1978).

The mathematics are simplified considerably if cylindrical coordinates are used; and the development of an explicit finite difference solution is facilitated by appropriate divison of problem space into cells.

3.1 Division of problem space into cells

To take advantage of the cylindrical symmetry, a pie-shaped sector of angle one radian and unit depth is considered (Fig. 1, after Eickmeier et al., 1970).

If the radius of the cylindrical heat source is specified by r_o, cells outside the source can be generated by a scale factor a, so that successive cell radii are ar_o, a^2r_o, a^3r_o, ..., a^nr_o. A third dimension can be added by considering a stack of these pie-shaped sections along the length of the cylinder. Physical properties and temperatures for an individual cell are considered uniform within the cell, but can be different from other cells. This geometry allows cells close to the source, where temperature conditions change most, to be small, while cells further from the disturbing source are larger in a geometric law sense.

In the cylindrical geometry considered here, and the pie-shaped sector envisaged for the numerical solution, any radius r within the medium outside the source radius r_o can be expressed as

$$r(n) = r_o a^{n-1} \quad ; \quad n \geq 1 \qquad (1)$$

where the scale factor "a" is a constant greater than 1. Integer values of n cause the space cell boundaries to be generated.

3.2 Cell Parameters

In developing the finite difference formulation in later sections, it will be convenient to pre-calculate properties that represent an entire cell. For example, the heat capacity of the nth cell can be calculated from the specific heat and density of the material comprising the cell and the cell geometry. Likewise, the latent heat capacity and a thermal resistance can be calculated. In a two-phase problem, values of heat capacity and thermal resistance would be required in both phase states.

The volume of the nth cell - the section of the pie-shaped sector between radii r_{n-1} and r_n (where subscripts denote integer values for n) is

$$V_n = \frac{(\pi r_n^2 - \pi r_{n-1}^2) \times 1}{2\pi} \tag{2}$$

$$= \frac{1}{2} r_0^2 \left[a^{2n-2} - a^{2n-4} \right] ; \quad n = 2, 3, \ldots$$

The heat capacity of this cell is

$$\begin{aligned} \mathcal{C}_n &= c_n \rho_n V_n \\ &= \frac{1}{2} r_0^2 c_n \rho_n \left[a^{2n-2} - a^{2n-4} \right]; \quad n = 2, 3, \ldots \end{aligned} \tag{3}$$

The latent heat capacity of the nth cell is defined as the amount of heat absorbed or released in changing the phase of the entire cell volume. We assume the pore saturant changes state completely at its freezing point. Consider a pore saturant of latent heat Λ(J kg^{-1}) and density ρ_w which occupies a fraction ϕ of the total volume of the medium. The latent heat density is defined as

$$L = \Lambda \rho_w \phi \tag{4}$$

Thus, the latent heat capacity of the nth cell is

$$\begin{aligned} H_n &= L V_n \\ &= \frac{1}{2} r_0^2 \Lambda \rho_w \phi \left[a^{2n-2} - a^{2n-4} \right]; \quad n = 2, 3, \ldots \end{aligned} \tag{5}$$

The temperatures calculated numerically in the model correspond to the centre (radially) of each cell. Thus the temperature of the nth cell is

$T_n = T(r'_n)$

where

$$r'_n = \frac{a^{n-1} r_0 + a^{n-2} r_0}{2} \tag{6}$$

The thermal resistance between adjacent cells is defined from the heat flow between cells due to the difference in their central temperatures. The thermal flux is

$$\omega = k \nabla T \tag{7}$$

and the temperature gradient can be calculated from the solution to the steady state heat conduction equation in cylindrical coordinates (section 3.5).

$$T(r) = (\text{constant}) + \frac{(T_{n+1} - T_n) \ln r}{\ln r'_{n+1} - \ln r'_n} \tag{8}$$

$$\omega(r) = \frac{k}{r} \frac{(T_{n+1} - T_n)}{\ln r'_{n+1} - \ln r'_n} \quad ; \quad n = 2, 3, \ldots \tag{9}$$

$$\text{where } r'_n < r < r'_{n+1}$$

The heat flow between cells is the product of the flux at radius r and the cross-sectional area (=r).

$$q = \frac{k \Delta T}{\ln r'_{n+1} - \ln r'_n} = \frac{k \Delta T}{\ln a} \tag{10}$$

The thermal resistance between the nth and (n+1)th cells is defined as

$$R_n = \frac{\ln a}{k_n} \quad ; \quad n = 2, 3, \ldots \tag{11}$$

Values for $\mathcal{R}_1$, $\mathcal{C}_1$ and H_1 do not follow from the general expressions since the first cell is taken as the entire segment out to radius r_o. The heat capacity can be calculated from the volume of this cell:

$$V_1 = \frac{1}{2} r_o^2 \tag{12}$$

$$\mathcal{C}_1 = \frac{1}{2} c_{WB} \rho_{WB} r_o^2 \tag{13}$$

where the subscripts "WB" refer to the properties of the drilling fluid in the wellbore. The latent heat capacity of the wellbore depends on the mix used for the drilling fluid:

$$H_1 = \frac{1}{2} \Lambda_{WB} \rho_{WB} \phi_{WB} r_c^2 \tag{14}$$

The thermal resistance $\mathcal{R}_1$ out of the first cell must take into account that the surface at r_o is maintained at a fixed temperature as a boundary condition. Thus, the thermal resistance into the adjacent cell will depend on the thermal conductivity of the second cell rather than the first, leading to an adjusted geometric factor in eq. 10, with

$$r_1 = r_o$$

$$r_2 = \frac{1}{2}(r_o + a r_o) \tag{15}$$

as a reasonable approximation. Hence

$$\mathcal{R}_1 = \frac{\ln\left[\frac{1+a}{2}\right]}{k_2} \tag{16}$$

Following cessation of disturbance, the wellbore is not necessarily isothermal radially. This formula for $\mathcal{Q}_1$ is used at all times, however, since good agreement is obtained with Jaeger's (1956) tabulations during cooling.

For $n \geqslant 2$, it is seen from eq. 11 that $\mathcal{Q}_n$ is independent of n if the conductivity is constant. From eq. 3 and 5

$$\mathcal{C}_{n+1} = a^2 \mathcal{C}_n \tag{17}$$

$$H_{n+1} = a^2 H_n \tag{18}$$

if the specific heats and densities are constant.

3.3 Basic Properties of the Medium

For any simulation, the thermal conductivity, specific heat and density of the medium must be known. In a two phase system, these properties are normally different in each phase.

In geophysical applications, what is measured sometimes in the laboratory are grain properties (i.e. without the pore saturant) and a good approximation of bulk properties (with the saturant) may be calculated using simple two component models. The bulk density of the material is calculated from the grain density and the density of the saturant in the appropriate phase. Using here the terminology suited to most geophysical applications where pore saturant is either water or ice,

$$\rho_u = \phi \rho_w + (1-\phi)\rho_g \quad \text{if unfrozen} \tag{19}$$

$$\rho_f = \phi \rho_i + (1-\phi)\rho_g \quad \text{if frozen} \tag{20}$$

where ϕ is the ratio of pore saturant to total bulk (porosity). In this work, the density of ice and water are assumed the same.

The bulk conductivity is calculated assuming a two component geometric model proposed by Woodside and Messmer (1961):

$$k_u = k_w^{\phi} k_g^{(1-\phi)} \quad \text{if unfrozen} \tag{21}$$

$$k_f = k_i^{\phi} k_g^{(1-\phi)} \quad \text{if frozen} \tag{22}$$

Bulk specific heats are calculated according to

$$c_u = \phi c_w + (1-\phi) c_g \quad \text{if unfrozen} \tag{23}$$

$$c_f = \phi c_i + (1-\phi) c_g \quad \text{if frozen} \tag{24}$$

In using these models to reconstruct the bulk properties, it is recognized that they are quite simplistic. It is assumed that the porespace is always saturated, and that in a change of phase all ice within a porespace changes to water at the freezing point.

3.4 Heat Conduction Equation

Fourier's equation describes the distribution of temperature T, in space and time, in a solid whose diffusivity is α:

$$\nabla^2 T = \frac{1}{\alpha}\frac{\partial T}{\partial t} \qquad (25)$$

In this equation, heat transfer is assumed to be by radial conduction alone and more complex, and sometimes important, processes such as convection and mass transfer are not considered here. In the present work, the above unsteady state heat conduction equation is solved numerically for cylindrical systems involving a phase boundary.

If the time derivative in Fourier's equation is zero, we have the steady state equation (Laplace's equation). It is easily solved analytically for the geometry we assume.

3.5 Steady State Solution

In cylindrical coordinates Laplace's equation is

$$\nabla^2 T = \frac{d}{dr}\left(r\frac{dT}{dr}\right) = 0 \qquad (26)$$

A general solution is (Ingersoll et al., 1954, p. 37)

$$T = A + B \ln r \qquad (27)$$

where A and B are constants to be determined from boundary conditions, i.e. T is known at two radii r_a and r_b.

$$T = T_a \quad \text{at} \quad r = r_a$$

$$T = T_b \quad \text{at} \quad r = r_b \tag{28}$$

Putting these in eq. 27

$$A = \frac{T_b \ln r_a - T_a \ln r_b}{\ln r_a - \ln r_b}$$

$$B = \frac{T_b - T_a}{\ln r_b - \ln r_a} \tag{29}$$

With the values thus obtained for A and B substituted into the general solution, eq. 27,

$$T(r) = \frac{T_b \ln r_a - T_a \ln r_b}{\ln r_a - \ln r_b} + \frac{(T_b - T_a) \ln r}{\ln r_b - \ln r_a} \tag{30}$$

This is the analytic solution of the steady state heat conduction equation. Its usefulness in problems of the type studied here is limited by the one boundary condition being the initial temperature of the medium, which is considered to lie at infinity.

3.6 Unsteady State Equation

The general time dependent equation (eq. 25) may be solved by the calculus of finite differences. Two approachs are outlined here; first, finite

difference formulas are used to approximate the derivatives in the partial differential equation; second, the equation is cast in the form of an equation of continuity and a solution developed of a more intuitive nature. Both cases require the problem space surrounding the cylindrical heat source to be divided into cells for numerical solution.

3.7 Replacing Partial Derivatives by Finite Differences

Fourier's equation (eq. 25) in cylindrical coordinates is

$$\frac{\partial^2 T}{\partial r^2} + \frac{1}{r}\frac{\partial T}{\partial r} = \frac{1}{\alpha}\frac{\partial T}{\partial t} \qquad (25)$$

Assuming the problem space is divided into cells n=1, 2, 3, ... and using finite difference formulas to approximate the derivates for the nth cell (Carnahan et al., 1969, p. 431),

$$\frac{T_n' - T_n}{\alpha_n \Delta t} = \frac{T_{n-1} + T_{n+1} - 2T_n}{(\Delta r_n)^2} + \frac{T_{n+1} - T_{n-1}}{2 r_n \Delta r_n} \; ; \quad n = 1, 2, 3, \ldots \qquad (31)$$

where the forward difference has been used for the time derivative and the central difference for the space derivative. Symbols are defined in Table 1. Solving for the new temperature T_n' in terms of the old values existing before the time step Δt,

$$= T_n\left[1 - \frac{2\alpha_n \Delta t}{(\Delta r_n)^2}\right] + \alpha_n \Delta t\left[\frac{T_{n-1} + T_{n+1}}{(\Delta r_n)^2}\right]$$

$$+ \alpha_n \Delta t\left[\frac{T_{n+1} - T_{n-1}}{2 r_n \Delta r_n}\right]$$

$$= T_n\left[1 - X\right] + \alpha_n \Delta t\left[Y\right] + \alpha_n \Delta t\left[Z\right] \quad (32)$$

where X, Y and Z are dummy variables. Starting with a known temperature distribution, temperatures at any later time can be calculated by successive application of this equation, i.e. by iteration. This is a finite difference solution to the unsteady state heat conduction equation.

This solution may be adapted to the present problem by relating r_n and Δr_n to the choice of cell subdivision, eq. 1. Considering n as a continuous variable $\geqslant 1$ for the moment, and differentiating with respect to n,

$$\frac{dr(n)}{dn} = r_0 a^{n-1} \ln a \quad (33)$$

and replacing the derivative with its finite difference approximation,

$$\Delta r_n = (r_0 a^{n-1} \ln a)\Delta n$$
$$= (r_n \ln a)\Delta n \qquad (34)$$

where subscripts denote integral values of n and the integer equivalent of (1) is used. The volume of the pie-shaped sector to radius r(n) is

$$V(n) = \frac{1}{2} r(n)^2 \qquad (35)$$

$$dV = r\,dr \qquad (36)$$

and replacing differentials with their finite difference approximations,

$$\Delta V_n = r_n \Delta r_n$$
$$= r_n^2 (\ln a)\Delta n \qquad (37)$$

This is a differential of the volume of the nth cell; if r_n and n are considered continuous variables, integration over n yields the cell volume (eq. 2).

The differential heat capacity is

$$\Delta \mathcal{C}_n = r_n^2 c_n \rho_n \ln a \, \Delta n \qquad (38)$$

and the differential latent heat capacity is

$$\Delta H_n = \Lambda \rho \phi r_n^2 \ln a \, \Delta n \qquad (39)$$

Replacing r_n in (32) with (1) relates the finite difference solution to the particular cell division selected for the problem. Similarly, replacing Δr_n with (34) is justified as the "smallness" of Δr_n relative to r_n is preserved, i.e.

$$\frac{\Delta r_n}{r_n} = \frac{[r_n \ln a]}{r_n} < 1 \qquad (40)$$

for $\Delta n=1$ and the scale factor a within normal range of usage, $1 < a < 1.5$. Continuing with (eq. 32) and working with the dummy variables X, Y and Z,

$$X = \frac{2\alpha_n \Delta t}{(\Delta r_n)^2} = \frac{2 k_n \Delta t}{c_n \rho_n r_n^2 (\ln a)^2} = \frac{\Delta t}{\mathcal{C}_n} \cdot \frac{2}{\mathcal{R}_n}$$

$$Y = \alpha_n \Delta t \left[\frac{T_{n-1} + T_{n+1}}{(\Delta r_n)^2} \right] = \frac{X}{2} \left[T_{n-1} + T_{n+1} \right]$$

$$= \frac{\Delta t}{\mathcal{C}_n} \left[\frac{T_{n-1} + T_{n+1}}{\mathcal{R}_n} \right]$$

$$Z = \alpha_n \Delta t \left[\frac{T_{n+1} - T_{n-1}}{2 r_n \Delta r_n} \right]$$

$$= \frac{k_n \Delta t}{c_n \rho_n} \left[\frac{T_{n+1} - T_{n-1}}{2 r_n^2 \ln a} \right]$$

$$= \frac{\Delta t}{b_n} \left[\frac{T_{n+1} - T_{n-1}}{R_n} \right] \frac{\ln a}{2} \qquad (41)$$

The factor $\frac{\Delta t}{b_n R_n}$ is common to terms Y and Z. The factor

$$\left[T_{n+1} - T_{n-1} \right] \frac{\ln a}{2} \qquad (42)$$

from term Z for values of the radial multiplier used in this problem ($1<a<1.5$) will always be considerably smaller in absolute magnitude than

$$\left[T_{n+1} + T_{n-1} \right] \tag{43}$$

from term Y. Hence to a first approximation we neglect term Z. The solution then becomes

$$T_n' = \frac{\Delta t}{\mathcal{C}_n \mathcal{R}_n} T_{n-1} + \left[1 - \frac{\Delta t}{\mathcal{C}_n} \left(\frac{2}{\mathcal{R}_n} \right) \right] T_n + \frac{\Delta t}{\mathcal{C}_n \mathcal{R}_n} T_{n+1} \tag{44}$$

which indicates that the new temperature of cell n is an explicit function of temperatures before the time step Δt of itself and of adjacent cells, and a function of physical and geometric properties.

When a two phase system is involved, eq. 44 will be inadequate because (i) no provision is made for satisfying a latent heat budget of the region changing phase, and (ii) the values of $\mathcal{R}_n$ and $\mathcal{C}_n$ depend on the phase state of the nth cell, e.g. frozen or unfrozen.

However, both of these requirements for a two phase system may be satisfied in a numerical solution. At each iteration, the phase state of each cell can be determined, and the appropriate value of $\mathcal{R}_n$ and $\mathcal{C}_n$ (e.g. frozen or unfrozen) may be used. An algorithm may be designed for the special problem of a phase change occurring within a cell to account for the latent heat involved.

On the other hand, casting Fourier's equation into an equation of continuity yields the same explicit equation as (44) but involves intermediate steps which make the treatment of two phases simpler in a computer solution.

3.8 Intuitive Development of Solution

Fourier's equation can be reduced to the form of a continuity equation through use of traditional definitions of the diffusivity α and the heat flux ω (heat flow per unit cross-sectional area), i.e.

$$\alpha = \frac{k}{\rho c}$$

$$\omega = k \nabla T$$

$$\nabla \cdot \omega = k \nabla^2 T \qquad (45)$$

and substituting in eq. 25 yields

$$\nabla \cdot \omega = \rho c \frac{\partial T}{\partial t} \qquad (46)$$

which is in the form of an equation of continuity. The divergence on the left-hand side represents the difference between heat fluxes into and out of a cell. This results in a change in temperture within the cell according to the right-hand side of the equation. Replacing the time derivative by its finite difference approximation yields

$$(\nabla \cdot \omega)\Delta t = \rho c \Delta T \qquad (47)$$

that is, for a particular cell

(Heat in)-(Heat out) = (Heat stored in cell as temperature change) (48)

This equation may be applied over the time interval Δt to find the temperature change arising within a cell from the imbalance in heat flow $\nabla \cdot \omega$, provided Δt is chosen smaller than the thermal time constant of the system. Then the temperature at any time t within a cell can be found by iterating over many increments of Δt and over all cells.

The above conceptual equation may be cast in a mathematical form suitable for the problem by using results from section 3.2. There it is noted that $\mathcal{R}_n$ expresses the thermal resistance from a cell n to cell (n+1); eq. 10 gives the heat flow between these two cells for a temperature difference $T_n - T_{n+1}$.

$$q_n = \frac{T_n - T_{n+1}}{\mathcal{R}_n} \qquad (49)$$

The quantity of heat flowing out of cell n over the iteration interval Δt is

$$\text{(Heat out)} = q_n \Delta t = \frac{T_n - T_{n+1}}{\mathcal{R}_n} \cdot \Delta t \qquad (50)$$

Likewise, the heat into the nth cell from the (n-1)th cell is

$$\text{(Heat in)} = q_{n-1}\,\Delta t = \frac{T_{n-1} - T_n}{\mathcal{R}_{n-1}} \cdot \Delta t \qquad (51)$$

Using the cell heat capacity $\mathcal{C}_n$ (eq. 3), the heat stored in the nth cell is

$$\text{(Heat stored as temperature rise)} = \mathcal{C}_n \left(T_n' - T_n \right) \qquad (52)$$

Putting these expressions into the conceptual equation and regrouping,

$$T_n' = \frac{\Delta t}{\mathcal{C}_n \mathcal{R}_{n-1}} T_{n-1} + \left[1 - \frac{\Delta t}{\mathcal{C}_n} \left(\frac{1}{\mathcal{R}_{n-1}} + \frac{1}{\mathcal{R}_n} \right) \right] T_n + \frac{\Delta t}{\mathcal{C}_n \mathcal{R}_n} T_{n+1} \qquad (53)$$

This is the same as eq. 44 if the thermal resistance is independent of n; however intermediate expressions (50), (51), and (52) simplify the computer solution.

The temperature within the source region (n=1; $0<r<r_o$) is a constant for the duration of the source disturbance; thereafter, T_1' can be derived from eq. 48, provided that the heat into the cell is zero, because of the radial symmetry involved.

$$T_1' = \left[1 - \frac{\Delta t}{\mathcal{C}_1 \mathcal{R}_1} \right] T_1 + \frac{\Delta t}{\mathcal{C}_1 \mathcal{R}_1} T_2 \qquad (54)$$

3.9 Initial and boundary conditions

Conditions normally required for the solution of Fourier's equation have been integrated into the numerical solution in the simplest possible manner.

(i) Initial conditions. The problem space surrounding the source is at the geothermal temperature before a simulation commences.

(ii) Boundary conditions. The source surface is maintained at a fixed or simply varying temperature for the duration of the source disturbance as the inner boundary condition. Thereafter, it is allowed to change freely in relaxing to initial conditions. The distant boundary condition for the transient solution must be at the geothermal temperature, and this is achieved by holding the outer cell in the space subdivision at this value. Because of the geometric increase in the size of the problem space as the number of cells is increased, it is simple to ensure that such a boundary has no effect on the transient solution (i.e. the heat flux from the second-to-last to the outside cell is always negligible). If the boundary is too close for the times being considered, a steady-state solution will be forced (section 3.5, eq. 30). This boundary condition is maintained for the duration of the simulation.

3.10 Stability and choice of time step

When a numerical technique is used to solve a problem, it must be shown to be stable, consistent and convergent. By convergence one means that the numerical solution tends towards the analytic solution as the space and time subdivisions tend to zero. Consistency implies that the method approximates the partial differential equation intended and not some other equation.

Carnahan et al (1969, chap. 7.10, 7.11) discusses these properties, and shows that for Fourier's partial differential equation, an explicit finite difference solution is

$$T_n' = \lambda T_{n-1} + (1-2\lambda) T_n + \lambda T_{n+1} \qquad (55)$$

Carnahan et al demonstrate that $\lambda \leq 1/2$ is sufficient for stability, a fact appreciated equally from an intuitive feeling that the new temperature T_n' must depend on the old temperature T_n in a "non-negative way". Further, the truncation error (the difference between the finite differences and the derivatives they approximate) is

$$O(\Delta t) + O(\text{space subdivision})^2 \qquad (56)$$

Clearly, as the space and time subdivision approaches zero, the explicit finite difference representation approaches the analytic equation.

With stability thus established, and consistency demonstrated, convergence automatically follows (Carnahan et al, chap. 7.10).

Equation (53) is similar to eq. (55) but differs in the coefficients of T_{n-1}, T_n and T_{n+1}. However, in the special case of a medium of one phase, (eq. 11)

$$Q_n = Q_{n-1}$$

Thus (53) becomes

$$T_n' = \frac{\Delta t}{C_n R_n} T_{n-1} + \left[1 - \frac{2\Delta t}{C_n R_n}\right] T_n + \frac{\Delta t}{C_n R_n} T_{n+1} \tag{57}$$

i.e. from (55),

$$\lambda = \frac{\Delta t}{C_n R_n} \leq \frac{1}{2} \tag{58}$$

for stability; thus

$$\Delta t \leq \frac{C_n R_n}{2} \quad \text{for all } n \tag{59}$$

By analogy, we may consider in the general case (53) that the coefficient of the T_n term is $(1-2\lambda)$ and hence

$$\Delta t \leq \frac{R_{n-1} R_n C_n}{R_{n-1} + R_n} \tag{60}$$

is taken as a satisfactory criteria for stability. Indeed, this ensures that T_n contributes to T_n' in a non-negative way, as suggested by Eickmeier et al. (1970).

From Section 3.2, $\mathcal{Q}_n$ and $\mathcal{E}_n$ depend on the physical properties and cell subdivisions used. In the general problem of a two phase system, Δt must be chosen smaller than the largest value that the right side of (60) can attain.

The expression on the right in (60) is the thermal time constant of the system and hence response to a transient source disturbance and ultimate decay is governed by this characteristic time.

Equation (53) accommodates a two phase system in that $\mathcal{Q}_n$ and $\mathcal{E}_n$ can be specified according to the phase of the material in the nth cell. If the nth cell is actively undergoing a change of state, its entire volume is held at the freezing point and the imbalance in heat flowing into and out of the cell contributes to a latent heat budget rather than a temperature change.

4. Computer Solution

The methods by which the elements of theory developed in section 3 are cast into a computer solution are described in this section. The computer listing is not published but will be made available on request.

The explicit finite difference method was used for the numerical solution. The explicit formulation was chosen in preference to the implicit method because of the ease with which latent heat could be incorporated. The latter method would be preferable in simulations to great lengths of time, however, because of its less restrictive choice of time step. The finite difference method and the cell division employed here is ideally suited to this cylindrically symmetric problem and its boundary conditions.

4.1 The computer technique

Depending on the relative values of the geothermal temperature Tg and the temperature Ts of the source, three separate modes can be distinguished:

1) $Tg > 0^{o}C$; $Ts > 0^{o}C$

   $Tg < 0^{o}C$; $Ts < 0^{o}C$

   - no melting or freezing, thus a single phase problem

2) $Tg < 0^{o}C$; $Ts > 0^{o}C$

   - melting around the wellbore will occur e.g. drilling in permafrost

3) $Tg > 0^{o}C$; $Ts < 0^{oC}$

   - freezing around the source, e.g. chilled pipeline through region of discontinuous permafrost

Much of program logic depends on the basic mode; in this work and Taylor (1978), only the first two modes are considered and Tg is always less than Ts.

The choice of cell size (factor a, section 3.1) and the number of cells is governed by the resolution desired near the source region and by the requirement of no appreciable radial heat flow at the boundary of the problem space. Normally, $1 < a < 1.5$ and the number of cells $n \leq 20$. Stacking a series of the pie-shaped sectors along the wellbore creates the third dimension but such is valid only as long as temperature gradients arising from the disturbance are small in a direction parallel to the source cylinder compared to the radial gradients. The program is essentially two dimensional in that only radial heat flow is considered. Validity of this assumption is discussed in the next section.

The time increment chosen for the iteration must be smaller than the thermal time constant of the system. Generally it is chosen at 90% of the maximum value that eq. (60) can attain.

Basic physical properties of the medium - thermal conductivity, specific heat and density must be supplied. Sometimes these are not available, as perhaps, measurements are made on chip samples or, in the two phase case, on only unfrozen samples. The properties of the bulk material must be calculated according to section 3.3. In doing so, the following values for ice/water are used:

$k_{ice} = 2.26\ Wm^{-1}\ K^{-1}$

$k_{water} = 0.502$ " "

$c_{ice} = 2090\ Jkg^{-1}\ K^{-1}$

$c_{water} = 4187$ " "

$\rho_{ice}, \rho_{water} = 1000\ kg\ m^{-3}$

$\Lambda = 334690\ Jkg^{-1}$

Thence, cell properties are calculated according to section 3.2.

The iteration procedure consists of using (50) to (54) inclusive to calculate the temperature change for each cell starting with the wellbore cell and working outwards to the outer cell. In the two phase case, logic elements in the program determine the phase state of the cell - frozen, undergoing thawing or freezing, or unfrozen. If the temperature change of an iteration would cause a particular cell's temperature to cross the freezing point, that cell is held at the freezing point. In successive iterations, the imbalance in heat flowing into and out of such a cell is accumulated (latent heat budget) until it equals the total latent heat capacity of the cell. Thereafter, program logic allows the temperature of the cell to change according to (53).

In the two-phase case, the heat flowing into and out of a cell will depend on the phase state of the adjacent cells. In some cases, the average value of the frozen and unfrozen thermal resistances, (eq. 11) are used. If three adjacent cells are "unfrozen - undergoing thaw - frozen", the thaw front will be somewhere within the middle cell. A realistic value of the thermal resistance from the middle cell to the frozen cell is an average of the frozen and unfrozen values. This reasoning has been used in similar cell environments.

The temperature calculated in this and all cases is the average temperature of the cell, and is assumed to reside at the cell's mid-point radially. For an actively thawing or freezing cell, this will not be true and a small step-like character is imparted to the numerical solution in the two-phase case. This is discussed in Taylor (1978, Appendix A.6 and Figure 2).

The program keeps account of an active latent heat budget - the heat actually involved in a phase change. This, when compared to the maximum latent heat capacity of the pie-shaped sector (eq. (5) and figure 1), allows the program to calculate the position of the thaw front.

Temperatures at selected dimensionless radii (as in Appendices A and C) are interpolated from temperatures calculated at the cell centers, using the steady state solution, eq. 30.

The heat flow leaving the source region is dependent on the radius of the source and on the conductivity of the material surrounding the source. Hence, for the tables in Appendices B and D, values are quoted for a radius of one metre and a medium of conductivity one Wm^{-2}. Values may be converted for a particular application by use of the conductivity-radius factors described in Taylor (1978, section 4).

5. Limitations of the Program

The solution to the transient heat conduction equation in cylindrical coordinates presented here is based on the simple theory of heat transfer by radial conduction alone. This, when cast into the numerical solution using the finite difference method, is a macroscopic approximation to a process that is complex on the microscopic level. The success of the program is measured by its ability to predict reasonable models of a thermal disturbance and by its agreement with field measurement.

5.1 Effect of ignoring conduction parallel to axis

This program is two dimensional, ignoring heat transfer in a direction parallel to the source cylinder, normally the vertical sense. Temperature gradients within the problem space arise from the source disturbance but heat transfer arising from the vertical gradient is not considered in this program. This simplification has considerable impact on the computing requirements (factor of 2) and results in a significant error in only one respect in simulating a well.

During drilling, and for several drilling periods after completion of a well, the temperature gradients within the formation in the radial direction are much greater than those in the vertical direction. In a permafrost environment, a contrast in physical properties exists across the permafrost base. With the latent heat involved in the phase change, a large temperature discontinuity develops across the permafrost base. This step (up to several degrees over 50 m) develops during drilling and persists for a number of drilling periods after (Taylor and Judge, 1977; well numbers 193, 196, 272, 277 and others).

The program predicts temperature steps of a magnitude similar to that observed in early temperature logs in some Arctic wells. However, the program predicts such steps to persist for much longer than they do in nature. Heat transfer undoubtably occurs vertically across these steps. The simplification of considering radial conduction only provides a reasonable estimate of the magnitude of the temperature step but it predicts neither the vertical distance over which it occurs (i.e. the gradient) nor its duration at times larger than a couple of drilling periods after completion.

5.2 Effects of other heat transfer mechanisms

The effects of approximating the solution numerically has been described in Taylor (1978), section A.6. The usual choice of source (or wellbore) size and geometric factor ($1.2 < a < 1.5$) creates a spatial subdivision which precludes a study involving more than average physical properties.

Omitted from the theory is any consideration of mass transfer. Fluid is known to migrate outwards in the region of the wellbore in response to the hydraulic gradient and to the mass diffusion from a warmer to a cooler region. If a drilling mud is used, the mud may penetrate the formation and the thermal conductivity would be altered; a layer of mud-cake may form on the formation wall. Such a process is self-limiting through the clogging of the pores and the consequent reduction in permeability. While these processes cannot be modelled by the program, their effect could be estimated to some degree by assigning appropriate properties to a thin annulus of formation around the bore. Likewise, the migration of moisture to a freezing boundary is a microscopic effect not considered in this program.

5.3 Effect of phase change at constant temperature

The program assumes the phase change in permafrost occurs at a constant temperature rather than over a temperature interval, decreasing as freezing occurs on a local scale. Results computed by the program below $0^{o}C$ (or whatever temperature is chosen) are interpreted to be "frozen" when in nature the pore space may consist of ice and supercooled water.

In assessing the thermal disturbance in gas hydrates, the phase curve and latent heat appropriate for the hydrate being considered may be used in the program. The model can predict the amount of hydrate melted and converted to gas and water but at present is incapable of simulating freeze-back of the disturbed system.

Phenomena known to occur on a microscopic scale have been "averaged-out" in this study. Some authors have included such effects as convection and mass migration, only to ignore the latent heat of a phase change in a permafrost environment. Generally speaking, the very large latent heat of ice/water plays the major role in determining the thermal response to a disturbance.

In assessing the limitations of the program, one may bear in mind that the purpose of the program is to provide a basically accurate model of the thermal response to drilling or production in permafrost terrain. In modelling a well on which a number of temperature logs have been obtained, one may have measurements on the physical properties of the formation (through core, chip samples and/or geophysical logs) only to be limited by rather rough records of the drilling history (times, temperatures).

The geothermal temperature in such wells may be calculated from a series of temperature profiles using a logarithmic return to equilibrium formula (Lachenbruch and Brewer, 1959). On the other hand, predicting the disturbance

expected in a new area is limited by what one might know of the physical properties of the formation and the geothermal temperatures. To adopt a more intricate theory does not seem warranted as long as the input data to the simulation must often be approximated.

6. Modelling the thermal regime of a Mackenzie Delta Well

The best test of the program is its ability to model a known geophysical situation. The magnitude of the error that may be attributed to the limitations of such a simple model may then be assessed.

The Geothermal Studies group at the Earth Physics Branch, and the Dept. of Geography at U.B.C., have taken a series of temperature logs of the upper 500 m over 9 years at the Mackenzie Delta Reindeer Well (#63, Taylor and Judge, 1975). This program was used in an attempt to duplicate these logs.

As input, the program requires the physical properties of the formation and parameters of the drilling program. Thermal conductivities and densities of the drill cuttings from this well were measured in our laboratory. The porosity (about 22%) was estimated from the continuity of the terrestrial heat flow across the permafrost base and confirmed by Judge (personal communication) from the formation density logs. The program requires the geothermal (undisturbed) temperature as a boundary condition; this was calculated from the logarithmic return to equilibrium of the 9 logs taken over 9 years (Taylor and Judge, 1975; Lachenbruch and Brewer, 1959). Thus the objective is to duplicate the logs for several years after completion of the well; calculated temperatures are forced by the boundary conditions to approach the geothermal temperature at greater times.

The first log measured on the well was taken 6 months after completion. Temperatures in the upper 325 m are all between -1° and $0^{\circ}C$. This is interpreted as representing the depressed freezing temperatures at these depths, so such are used in the model. Below 325 m, a freezing temperature of $0^{\circ}C$ is adopted.

Mud temperatures were not available from the drilling logs so this was used as the fitting parameter and various logs were matched by trial and error. Generally, a mud temperature in the range 10° to $24^{\circ}C$ was found to give a satisfactory match and these are construed as reasonable average disturbance temperatures over the drilling history of the well at these depths.

Table 2 compares the measured temperatures with those calculated by the program for three logs. Log 1 was measured one drilling period following well completion (equal to 6 months), log 2 three periods and log 4, seven periods or 3½ years after. Also shown is the geothermal temperature calculated as described (column 8). Temperatures measured in the field give no indication of the size of the thaw bulb, but this is calculated by the program and shown in column 9 of the table. Most of the heat passing into the formation is involved in melting. An estimate of this is given in column 10, in units of Joules over a 30 m section of well centered at the depth in question. Column 11 gives the value of mud (source) temperature at each depth required to produce the best match to the series of temperature logs.

Generally speaking, the calculated temperatures agreed with the measured profiles within less than a tenth of a degree below the permafrost and within several tenths of a degree within the frozen section. These results are shown as well in Figure 2. The calculated values (solid dots) coincide with measured temperatures within the accuracy of the graph except at several depths where the measured values are shown by stars. The general agreement is excellent, expecially in view of the simplicity of the model. From this we conclude that the program is capable of realistically predicting the disturbed thermal regime in real environments.

Using the same parameters (including mud temperatures) the program was used to simulate the effect had an insulating annulus been emplaced around the wellbore during drilling.

The Reindeer well was drilled over a period of six months to a depth of 3800 metres, and yet the permafrost was penetrated in 20 days. Table 3 and Figure 2 show the effect on two temperature logs of emplacing 5 cm of gelled diesel as insulation between casing strings at that time. The calculations indicate that with this insulation, some melting would have occurred over the entire permafrost section but that the thaw radius would have been reduced to one-half to 2/3 of the uninsulated case, and that the insulation would reduce the radial heat flux by 50 to 70%. The first log predicted with such insulation suggests that refreezing over a short section would have occurred. By 3 periods following drilling (log 2), the temperature profile for the insulated case would have been within 0.2°C of the geothermal temperature with refreezing completed.

7. Conclusion

The tables presented here and in Taylor (1978) find application in giving an "off-the-shelf" solution to a variety of geophysical problems in permafrost. Parameters selected in this set of tables will seldom coincide with those of a particular application, but in many cases will be sufficient for engineering purposes.

The computer program itself is capable of describing a fairly complete thermal regime of a much wider variety of problems. The latent heat, density and freezing point of the pore saturant is variable and simple problems involving gas hydrates may be modelled. The ability of the program to include a source region encircled by annuli of properties different from the medium as a whole allows the possibility of modelling wellbore casing and cement or insulating annuli. The latter is most useful in predicting the thermal regime in oil or gas production situations.

The program is thought of as normally modelling wellbores that are "vertical". It may equally well consider "horizontal" problems such as pipelines, although there is no provision for seasonal temperature variations.

In this work and Taylor (1978), only cases of disturbance temperature warmer than the medium have been treated. The program considers equally well the problem of a disturbance cooler than the medium and involving a phase change.

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TABLES

Table 1 List of symbols

Table 2 Measured temperature logs taken on the Mackenzie Delta Reindeer D-27 well. Temperatures calculated by this program to correspond to the same times are shown in columns 3, 5 and 7. The maximum thaw radius and melting (over 30 m depth intervals) predicted by the program are given in columns 9 and 10. The mud temperature hypothesized at each depth, giving a good match of the calculated temperature to that measured, is shown in column 11.

Table 3 Temperatures calculated to correspond to the first two measured logs had an annulus of 5 cm of gelled diesel been used as insulation.

TABLE 1.

List of symbols used in theory

r	radial distance in cylindrical coordinates (m)
r_o	source radius (m)
a	radial multiplier
T	temperature (^oC)
t	time (s)
t_o	duration of source (s)
α	thermal diffusivity (m^2s^{-1})
k	thermal conductivity ($Wm^{-1}K^{-1}$)
c	specific heat ($J\ kg^{-1}K^{-1}$)
ρ	density ($kg\ m^{-3}$)
Λ	specific latent heat of pore saturant ($J\ kg^{-1}$)
L	latent heat density of medium (Jm^{-3})
ω	heat flux (Wm^{-2})
ϕ	porosity, volume fraction
g,w,i	subscripts denoting grain, water and ice properties
u,f	subscripts denoting unfrozen and frozen properties
A	subscript denoting medium in its original phase state
B	Subscript devoting medium of phase different from the original

Cell Properties:

n	subscript denoting nth cell
$\mathscr{R}_n$	thermal resistance from nth to (n + 1)th cell ($W^{-1}mK$)
$\mathscr{C}_n$	heat capacity of nth cell (JK^{-1})
H_n	latent heat capacity of nth cell (J)
q_n	heat flow out of nth cell (W)

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LATITUDE 69 DEGREES 6.1 MINUTES NORTH LONGITUDE 134 DEGREES 36.9 MINUTES WEST

ELEVATION 29 METERS

SUMMARY OF DEPTH-TEMPERATURE LOGS

DEPTH (M)	DATE 9 7 66 MEASURED TEMP (C)		DATE 9 7 66 CALCULATED TEMP (C)	DATE 2 7 67 MEASURED TEMP (C)		DATE 2 7 67 CALCULATED TEMP (C)	DATE 14 7 69 MEASURED TEMP (C)		DATE 14 7 69 CALCULATED TEMP (C)	EQUILIBRIUM TEMP (C)	MAXIMUM THAW RADIUS (m)	MAXIMUM MELTING (J per 30m depth) ($x10^{10}$)	MUD TEMP (C)
18.3	-.09						-5.77						
48.8	-.16						-5.10						
79.2	-.19		-.19	-2.86		-3.01	-4.69		-4.76	-5.59	2.32	3.70	24.70
109.7	-.17		0.00	-.95		-.17	-3.66		-3.91	-4.67	2.32	3.80	21.50
140.2	-.25		0.00	-1.13		-.25	-3.29		-3.53	-4.17	2.32	3.80	17.50
170.7	-.40		0.00	-2.13		-2.36	-3.28		-3.43	-3.92	2.08	3.00	13.00
201.2	-.41		-.41	-1.76		-1.47	-2.68			-3.23	1.93	2.70	10.00
231.6	-.42		-.38	-1.32		-.42	-2.08		-2.07	-2.53	2.16	3.30	10.00
262.1	-.26		0.00	-.46		-.26	-1.48		-.83	-1.80	2.28	3.50	10.00
292.6	-.12		-.12	-.37		-.12	-.71		-.12	-1.11			19.00
323.1	-.22		0.00	-.34		-.22	-.42		-.22	-.62	2.49	4.30	10.00
353.6	.50	LOG 1	.02	-.05	LOG 2	0.00	-.20	LOG 4	0.00	-.35	3.32	7.70	19.30
384.0	2.53		2.55	1.27		1.27	.73		.75	.31			19.30
414.5	3.28		3.28	2.05		2.05	1.55		1.56	1.13			19.30
445.0	3.95		3.94	2.76		2.76	2.27		2.28	1.87			19.30
475.5	4.75		4.84	3.55		3.60	3.07		3.25	2.66			23.10
506.0	5.42		5.48	4.24		4.21	3.78		3.95	3.38			23.10
536.4	6.14		6.15	4.98		4.99	4.51		4.52	4.12			23.10
566.9	6.89		6.83	5.72		5.72	5.26		5.41	4.88			23.10
597.4	7.74		7.72	6.66		6.66	6.23		6.37	5.87			23.10

TEMPERATURE RESULTS ARE OBTAINED FROM A MULTI-THERMISTOR CABLE
FURTHER TEMPERATURE LOGS ARE EXPECTED FOR THIS HOLE

B.A., SHELL, I.O.E. REINDEER D-27
- -WELL SPUDDED 8 7 65
- -DRILLING FOR 181 DAYS TO A TOTAL DEPTH OF 3861 METERS
- -WELL ABANDONED 5 1 66

N.B. CABLE INSTALLED BY E.P.B. MEASUREMENTS BY E.P.B. AND U.B.C.

TABLE 2

****

LATITUDE 69 DEGREES 6.1 MINUTES NORTH LONGITUDE 134 DEGREES 36.9 MINUTES WEST

ELEVATION 29 METERS

SUMMARY OF DEPTH-TEMPERATURE LOGS

DEPTH (M)	DATE 9 7 66 MEASURED TEMP (C)		DATE 9 7 66 CALCULATED TEMP (C)	DATE 2 7 67 MEASURED TEMP (C)		DATE 2 7 67 CALCULATED TEMP (C)	EQUILIBRIUM TEMP (C)	MAXIMUM THAW RADIUS (m)	MAXIMUM MELTING (J per 30m depth) ($x10^{10}$)
19.3	-.09								
48.8	-.16								
79.2	-.19		-.19	-2.86		-5.24	-5.59	1.45	1.50
109.7	-.17		-.17	-.95		-4.39	-4.67	1.43	1.50
140.2	-.25		-.25	-1.13		-3.99	-4.17	1.35	1.40
170.7	-.40		-2.59	-2.13		-3.82	-3.92	1.15	1.00
201.2	-.41		-2.28	-1.76		-3.17	-3.23	1.03	.83
231.6	-.42		-.42	-1.32		-2.45	-2.53	1.16	1.10
262.1	-.25		-.26	-.46		-1.65	-1.80	1.31	1.30
292.6	-.12			-.37			-1.11		
323.1	-.22	LOG 1	-.22	-.34	LOG 2	-.22	-.62	1.62	1.90
353.5	.50		0.00	-.05		0.00	-.35	2.22	3.50
384.0	2.53		1.37	1.27		.54	.31		
414.5	3.28			2.05			1.13		
445.0	3.95			2.76			1.87		
475.5	4.75			3.55			2.66		
505.0	5.42			4.24			3.38		
535.4	5.14			4.98			4.12		
565.9	6.89			5.72			4.88		
597.4	7.74			6.66			5.87		

TEMPERATURE RESULTS ARE OBTAINED FROM A MULTI-THERMISTOR CABLE
FURTHER TEMPERATURE LOGS ARE EXPECTED FOR THIS HOLE

B.A., SHELL, I.O.E. REINDEER D-27
-WELL SPUDDED 8 7 65
-DRILLING FOR 151 DAYS TO A TOTAL DEPTH OF 3861 METERS
-WELL ABANDONED 5 1 66

N.B. CABLE INSTALLED BY E.P.B. MEASUREMENTS BY E.P.B. AND U.B.C.

TABLE 3

43

Figure Captions

Figure 1 Schematic diagram showing cell structure around the cylindrical source, radius r_o, for numerical solution. The pie-shaped sector of angle one radian, is one metre in thickness and a third dimension can be attained by stacking sectors. The thermal resistance and heat flow into and out of the nth cell, and its heat capacity, are shown (after Eickmeier et al, 1970).

Figure 2 Temperature profiles calculated by the model (solid dots) to correspond to times of three measured profiles (stars) of the Mackenzie Delta Reindeer D-27 well. Where stars do not appear, the agreement is within the size of the solid dots. Log 1 was measured 6 months after completion; log 2, $1\frac{1}{2}$ years; and log 4, $3\frac{1}{2}$ years after. The undisturbed (geothermal) temperatures (squares) are calculated from logs measured annually over 9 years using a logarithmic return to equilibrium formula (Taylor and Judge, 1975). The open circles show the effect of placing an annulus of 5 cm of gelled diesel around the wellbore as insulation for the major portion of the 6 month drilling period. In log 2, the calculated position of such a profile is within 0.2°C of the geothermal temperature.

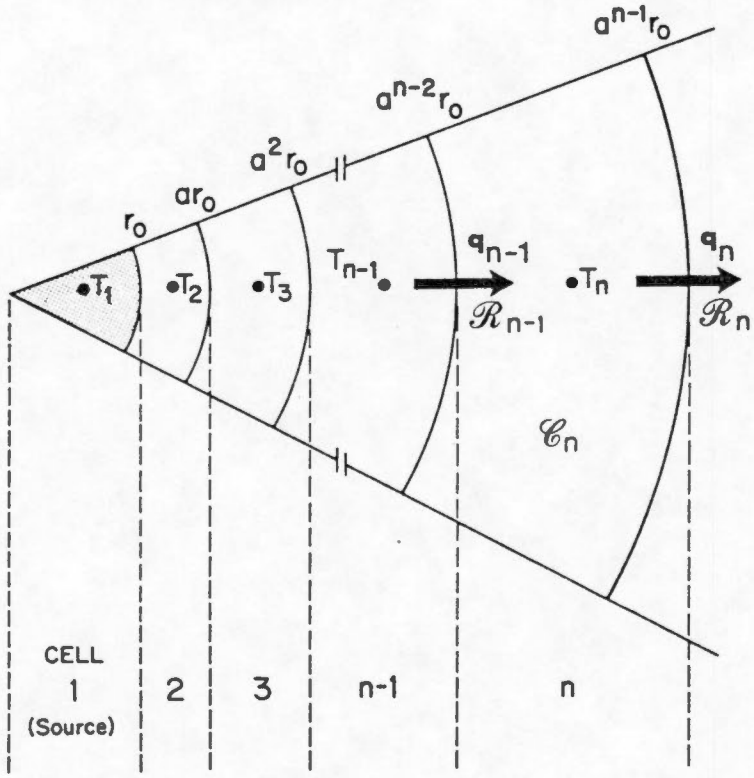
$a^{n-1}r_o$
$a^{n-2}r_o$
a^2r_o
ar_o
r_o
T_1
T_2
T_3
T_{n-1}
q_{n-1}
$\mathscr{R}_{n-1}$
T_n
q_n
$\mathscr{R}_n$
$\mathscr{C}_n$
CELL
1
(Source)
2
3
n-1
n

FIG 1

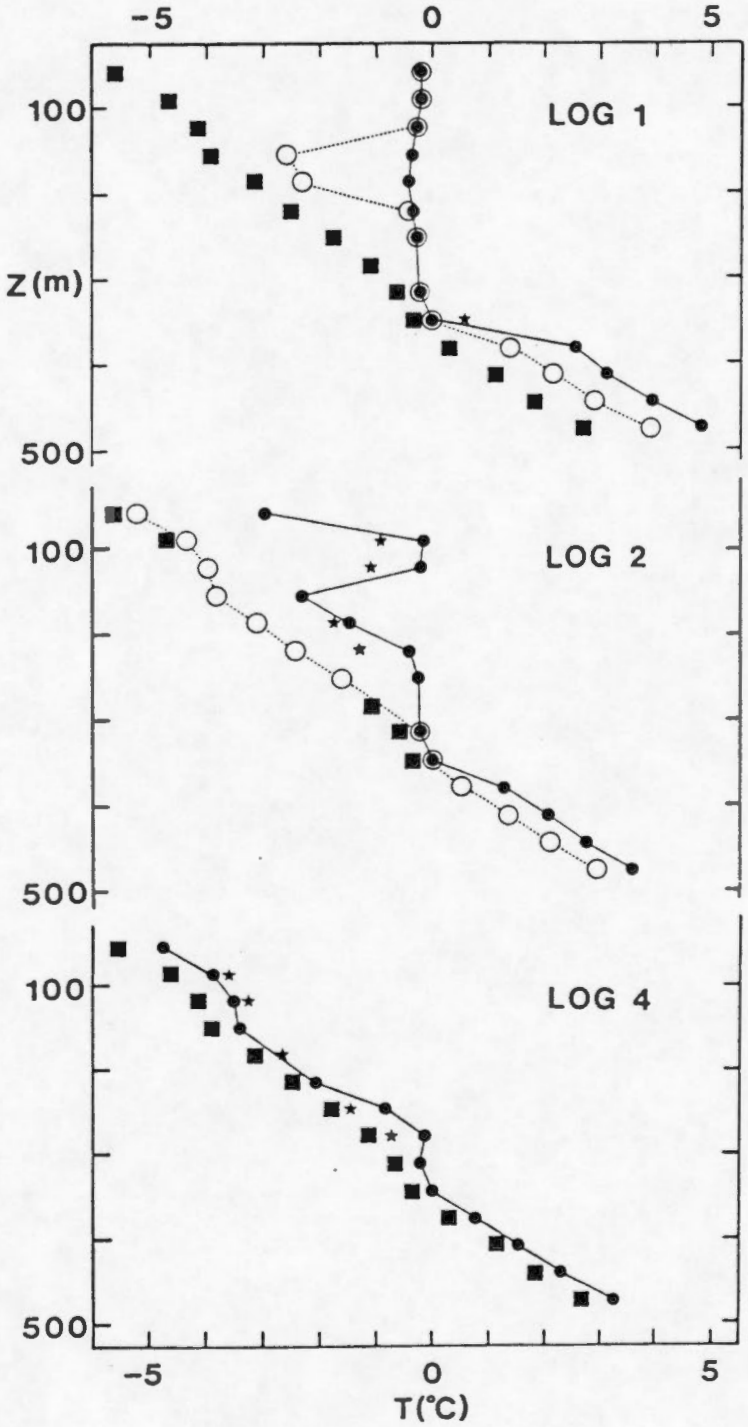

FIG 2

APPENDIX A. TABLES OF TEMPERATURE VERSUS TIME FOR A SUSTAINED SOURCE

A

Consider a homogeneous medium at constant initial temperature, bounded internally by a cylinder of radius r_o and constant temperature at time t greater than zero. The thermal conductivity, specific heat and density of the medium are k_A, c_A and ρ_A respectively, where the subscript A denotes the phase of the medium in its undisturbed state.

For a system not undergoing a phase change, the initial temperature is 0^oC. For a system that will experience a phase change, cases are presented for initial temperatures of -0.01^o, -5°, and -10^oC, and the phase change is assumed to occur at 0^oC. In all cases, the medium is initially in state A, compatible with the initial temperature, and the corresponding values k_A, c_A and ρ_A are used to calculate dimensionless time τ for all times. The latent heat density, L, is the heat required per cubic metre of medium to complete the change of state. It is defined from the latent heat Λ (J kg^{-1}) and density ρw of pore saturant which occupies a fraction ϕ of the total volume.

Parameters:

$$\alpha_A = \frac{k_A}{c_A \rho_A} \qquad (m^2 s)$$

$$\tau = \frac{\alpha_A t}{r_o^2}$$

$$R = \frac{r}{r_o}$$

$$L = \Lambda \rho_w \phi \qquad (Jm^{-3})$$

where r is the radial position within the medium from the center of the source cylinder.

The tables present temperatures in degrees Celsius within the medium at various values of dimensionless radii R and time τ. Index blocks along the lower edge of each table identify the parametric values used: latent heat density (MJ/m^3), source and initial temperatures (^oC).

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 10 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5
1	10.00	8.84	7.79	6.83	5.95	5.13	4.43	3.77	3.16	2.57	2.03	1.52	1.03	.57	.13	-.00
2	10.00	9.03	8.15	7.34	6.60	5.91	5.30	4.73	4.19	3.68	3.24	2.85	2.49	2.14	1.80	1.48
3	10.00	9.16	8.40	7.70	7.05	6.44	5.89	5.37	4.88	4.41	3.98	3.57	3.19	2.82	2.47	2.13
4	10.00	9.20	8.47	7.80	7.18	6.60	6.07	5.57	5.10	4.65	4.25	3.87	3.51	3.17	2.84	2.53
5	10.00	9.26	8.59	7.98	7.41	6.88	6.39	5.93	5.50	5.09	4.72	4.37	4.04	3.72	3.42	3.13
6	10.00	9.31	8.67	8.09	7.55	7.05	6.59	6.15	5.74	5.35	4.99	4.65	4.32	4.01	3.71	3.43
7	10.00	9.33	8.71	8.15	7.62	7.14	6.68	6.26	5.85	5.47	5.12	4.78	4.46	4.15	3.85	3.57
8	10.00	9.34	8.73	8.17	7.66	7.17	6.73	6.31	5.91	5.53	5.18	4.84	4.53	4.22	3.93	3.65
9	10.00	9.35	8.76	8.22	7.71	7.25	6.81	6.41	6.02	5.66	5.32	5.00	4.70	4.41	4.13	3.86
10	10.00	9.38	8.81	8.29	7.80	7.35	6.94	6.55	6.18	5.83	5.50	5.19	4.90	4.62	4.35	4.10
20	10.00	9.47	8.98	8.53	8.12	7.73	7.37	7.04	6.72	6.42	6.14	5.87	5.61	5.37	5.13	4.91
30	10.00	9.51	9.06	8.65	8.27	7.92	7.59	7.28	6.99	6.71	6.45	6.20	5.96	5.73	5.51	5.30
40	10.00	9.54	9.12	8.73	8.37	8.04	7.73	7.43	7.16	6.90	6.65	6.42	6.19	5.98	5.77	5.58
50	10.00	9.56	9.16	8.80	8.45	8.14	7.84	7.56	7.30	7.05	6.82	6.60	6.38	6.18	5.98	5.80
60	10.00	9.57	9.18	8.82	8.48	8.17	7.88	7.61	7.35	7.11	6.88	6.66	6.45	6.25	6.06	5.87
70	10.00	9.58	9.20	8.84	8.52	8.21	7.93	7.66	7.41	7.17	6.95	6.73	6.53	6.33	6.15	5.97
80	10.00	9.60	9.23	8.89	8.57	8.28	8.01	7.75	7.51	7.28	7.07	6.86	6.66	6.47	6.30	6.12
90	10.00	9.61	9.25	8.92	8.61	8.33	8.06	7.81	7.57	7.35	7.14	6.94	6.75	6.56	6.39	6.22
100	10.00	9.61	9.26	8.93	8.63	8.35	8.09	7.84	7.61	7.39	7.18	6.98	6.79	6.61	6.44	6.27
200	10.00	9.65	9.33	9.04	8.77	8.52	8.28	8.06	7.85	7.66	7.47	7.29	7.12	6.95	6.80	6.65
300	10.00	9.68	9.38	9.11	8.85	8.62	8.40	8.19	8.00	7.81	7.64	7.47	7.31	7.16	7.02	6.88
400	10.00	9.68	9.39	9.13	8.88	8.65	8.44	8.24	8.05	7.87	7.70	7.54	7.38	7.24	7.09	6.96
500	10.00	9.70	9.42	9.16	8.93	8.71	8.50	8.31	8.13	7.96	7.79	7.64	7.49	7.35	7.21	7.08
600	10.00	9.71	9.44	9.19	8.96	8.75	8.55	8.36	8.18	8.02	7.86	7.71	7.56	7.43	7.30	7.17
700	10.00	9.71	9.44	9.20	8.97	8.76	8.56	8.38	8.20	8.04	7.88	7.73	7.59	7.45	7.32	7.20
800	10.00	9.71	9.45	9.20	8.98	8.77	8.58	8.39	8.22	8.05	7.90	7.75	7.61	7.48	7.35	7.22
900	10.00	9.72	9.46	9.23	9.01	8.81	8.62	8.44	8.27	8.11	7.96	7.81	7.68	7.55	7.42	7.30
1000	10.00	9.72	9.47	9.24	9.03	8.83	8.64	8.47	8.30	8.15	8.00	7.86	7.72	7.60	7.47	7.36

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
10	10	-.01	---

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 10 MJ/M^3

TAU	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0
1	10.00	2.03	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
2	10.00	3.24	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
3	10.00	3.98	.91	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
4	10.00	4.25	1.37	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
5	10.00	4.72	1.96	.02	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
6	10.00	4.99	2.21	.45	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
7	10.00	5.12	2.33	.74	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
8	10.00	5.18	2.44	.76	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
9	10.00	5.32	2.75	1.21	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
10	10.00	5.50	3.02	1.46	.16	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
20	10.00	6.14	3.94	2.47	1.44	.56	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01
30	10.00	6.45	4.38	2.92	1.80	1.01	.48	.01	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01
40	10.00	6.65	4.71	3.38	2.39	1.63	1.02	.41	-.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01
50	10.00	6.82	4.97	3.67	2.67	1.88	1.22	.70	.26	-.00	-.00	-.00	-.00	-.01	-.01	-.01
60	10.00	6.88	5.05	3.76	2.77	1.96	1.28	.84	.50	.19	.01	-.00	-.00	-.00	-.01	-.01
70	10.00	6.95	5.17	3.93	3.00	2.27	1.67	1.21	.82	.40	-.00	-.00	-.00	-.00	-.00	-.01
80	10.00	7.07	5.36	4.16	3.25	2.52	1.93	1.44	1.01	.60	.20	-.00	-.00	-.00	-.00	-.00
90	10.00	7.14	5.47	4.30	3.39	2.67	2.06	1.55	1.11	.72	.38	.06	-.00	-.00	-.00	-.00
100	10.00	7.18	5.53	4.37	3.47	2.75	2.13	1.61	1.16	.80	.50	.22	-.00	-.00	-.00	-.00
200	10.00	7.47	5.99	4.94	4.13	3.46	2.91	2.43	2.00	1.63	1.29	.98	.75	.56	.38	.21
300	10.00	7.64	6.26	5.28	4.53	3.91	3.39	2.95	2.56	2.22	1.92	1.64	1.39	1.16	.95	.74
400	10.00	7.70	6.35	5.40	4.66	4.05	3.54	3.10	2.71	2.37	2.05	1.77	1.51	1.26	1.04	.84
500	10.00	7.79	6.50	5.59	4.88	4.31	3.82	3.41	3.04	2.72	2.43	2.17	1.93	1.72	1.52	1.34
600	10.00	7.86	6.61	5.72	5.03	4.47	3.99	3.59	3.23	2.90	2.62	2.35	2.11	1.89	1.68	1.49
700	10.00	7.88	6.64	5.76	5.08	4.52	4.05	3.65	3.29	2.97	2.68	2.41	2.17	1.95	1.74	1.54
800	10.00	7.90	6.67	5.80	5.13	4.58	4.11	3.71	3.36	3.05	2.77	2.51	2.28	2.07	1.88	1.70
900	10.00	7.96	6.76	5.92	5.26	4.73	4.28	3.89	3.55	3.24	2.97	2.72	2.50	2.29	2.10	1.92
1000	10.00	8.00	6.83	6.00	5.36	4.83	4.39	4.01	3.67	3.37	3.10	2.85	2.63	2.42	2.23	2.05

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
10	10	-.01	---

TEMPERATURES IN RADIAL HEAT FLOW
****

LATENT HEAT DENSITY, 10 MJ/M^3

R

TAU	1.0	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0	45.0	50.0	60.0	70.0	80.0	90.0	100.0
10	10.00	.16	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
20	10.00	1.44	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
30	10.00	1.80	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
40	10.00	2.39	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
50	10.00	2.67	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
60	10.00	2.77	.19	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
70	10.00	3.00	.40	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
80	10.00	3.25	.60	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
90	10.00	3.39	.72	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
100	10.00	3.47	.80	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
200	10.00	4.13	1.63	.38	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
300	10.00	4.53	2.22	.95	.03	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
400	10.00	4.66	2.37	1.04	.39	.04	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
500	10.00	4.88	2.72	1.52	.73	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
600	10.00	5.03	2.90	1.68	.84	.24	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01
700	10.00	5.08	2.97	1.74	.87	.37	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01
800	10.00	5.13	3.05	1.88	1.11	.60	.09	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01
900	10.00	5.26	3.24	2.10	1.33	.77	.23	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01
1000	10.00	5.36	3.37	2.23	1.44	.85	.35	-.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01
2000	10.00	5.73	3.90	2.83	2.08	1.50	1.03	.64	.34	.07	-.00	-.00	-.01	-.01	-.01	-.01
3000	10.00	5.92	4.16	3.15	2.43	1.89	1.46	1.11	.81	.55	.26	-.00	-.00	-.00	-.01	-.01

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
10	10	-.01	---

TEMPERATURES IN RADIAL HEAT FLOW

LATENT HEAT DENSITY, 10 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5
1	10.00	8.50	7.14	5.93	4.76	3.65	1.85	.17	-.35	-.71	-1.06	-1.39	-1.70	-2.00	-2.29	-2.56
2	10.00	8.68	7.49	6.47	5.40	4.47	3.71	3.00	2.33	1.70	1.10	.53	-.01	-.46	-.89	-1.30
3	10.00	8.90	7.90	6.99	6.14	5.34	4.44	3.59	2.79	2.03	1.31	.63	-.00	-.05	-.09	-.13
4	10.00	8.97	8.03	7.16	6.36	5.62	4.92	-.27	3.65	3.07	2.47	1.87	1.30	.75	.20	-.13
5	10.00	8.97	8.13	7.17	6.37	5.63	4.93	4.27	3.66	3.07	2.61	2.24	1.88	1.54	1.22	.90
6	10.00	9.04	8.16	7.36	6.62	5.92	5.29	4.70	4.14	3.60	3.13	2.70	2.29	1.90	1.53	1.17
7	10.00	9.10	8.29	7.54	6.84	6.20	5.60	5.04	4.51	4.01	3.52	3.04	2.58	2.14	1.72	1.32
8	10.00	9.14	8.36	7.65	6.98	6.37	5.79	5.26	4.75	4.27	3.77	3.25	2.76	2.29	1.84	1.41
9	10.00	9.17	8.42	7.73	7.09	6.49	5.94	5.42	4.93	4.47	4.03	3.62	3.24	2.86	2.51	2.17
10	10.00	9.19	8.46	7.78	7.15	6.57	6.02	5.51	5.03	4.57	4.14	3.73	3.34	2.97	2.61	2.27
20	10.00	9.30	8.67	8.08	7.54	7.03	6.56	6.12	5.71	5.31	4.94	4.59	4.25	3.93	3.63	3.33
30	10.00	9.34	8.74	8.19	7.68	7.21	6.76	6.34	5.95	5.58	5.22	4.89	4.57	4.26	3.97	3.69
40	10.00	9.38	8.81	8.29	7.81	7.36	6.94	6.54	6.17	5.82	5.49	5.17	4.87	4.58	4.31	4.05
50	10.00	9.42	8.89	8.40	7.95	7.53	7.13	6.77	6.42	6.09	5.78	5.48	5.20	4.93	4.67	4.42
60	10.00	9.44	8.93	8.46	8.03	7.62	7.24	6.89	6.55	6.24	5.94	5.65	5.38	5.12	4.87	4.63
70	10.00	9.44	8.94	8.47	8.04	7.63	7.26	6.90	6.57	6.25	5.96	5.67	5.40	5.14	4.89	4.65
80	10.00	9.44	8.94	8.47	8.04	7.63	7.26	6.90	6.57	6.26	5.96	5.67	5.40	5.14	4.89	4.65
90	10.00	9.46	8.96	8.51	8.09	7.69	7.33	6.98	6.66	6.35	6.06	5.79	5.52	5.27	5.03	4.80
100	10.00	9.48	9.00	8.57	8.16	7.78	7.43	7.10	6.79	6.49	6.21	5.94	5.69	5.45	5.22	4.99
200	10.00	9.52	9.08	8.68	8.30	7.96	7.63	7.33	7.04	6.77	6.51	6.26	6.03	5.81	5.59	5.39
300	10.00	9.57	9.17	8.81	8.47	8.16	7.87	7.59	7.33	7.09	6.86	6.63	6.42	6.22	6.03	5.84
400	10.00	9.57	9.19	8.83	8.50	8.29	7.90	7.63	7.37	7.13	6.90	6.69	6.48	6.28	6.09	5.91
500	10.00	9.59	9.22	8.87	8.56	8.26	7.98	7.72	7.48	7.24	7.02	6.81	6.61	6.42	6.24	6.07
600	10.00	9.61	9.25	8.91	8.61	8.32	8.06	7.80	7.57	7.34	7.13	6.93	6.74	6.55	6.38	6.21
700	10.00	9.61	9.26	8.94	8.64	8.36	8.10	7.86	7.63	7.41	7.20	7.00	6.81	6.64	6.46	6.30
800	10.00	9.62	9.27	8.95	8.65	8.38	8.12	7.88	7.65	7.43	7.23	7.03	6.85	6.67	6.50	6.34
900	10.00	9.62	9.27	8.95	8.65	8.38	8.12	7.88	7.65	7.43	7.23	7.03	6.85	6.67	6.50	6.34
1000	10.00	9.62	9.27	8.95	8.65	8.38	8.12	7.88	7.65	7.43	7.23	7.03	6.85	6.67	6.50	6.34

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
10	10	-5.0	---

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 10 MJ/M^3

R

TAU	1.0	3.0	4.0	5.0	7.0	10.0	12.0	15.0	20.0	25.0	30.0	40.0	50.0	60.0	70.0	100.0
1	10.00	-3.70	-4.72	-4.94	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
2	10.00	-2.61	-4.09	-4.67	-4.97	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
3	10.00	-1.56	-3.45	-4.33	-4.91	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
4	10.00	-1.22	-2.93	-3.96	-4.80	-4.99	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
5	10.00	-.65	-2.64	-3.68	-4.68	-4.97	-4.99	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
6	10.00	-.39	-2.31	-3.43	-4.55	-4.94	-4.99	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
7	10.00	-.22	-1.92	-3.15	-4.41	-4.91	-4.98	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
8	10.00	-.09	-1.60	-2.89	-4.27	-4.87	-4.97	-4.99	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
9	10.00	-.20	-1.47	-2.64	-4.13	-4.82	-4.95	-4.99	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
10	10.00	-.01	-1.30	-2.46	-3.98	-4.77	-4.93	-4.98	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
20	10.00	1.80	-.16	-1.22	-2.97	-4.23	-4.64	-4.87	-4.98	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
30	10.00	2.43	.50	-.73	-2.32	-3.72	-4.28	-4.69	-4.94	-4.99	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
40	10.00	2.89	1.13	-.19	-1.91	-3.37	-3.97	-4.49	-4.87	-4.96	-4.99	-5.00	-5.00	-5.00	-5.00	-5.00
50	10.00	3.32	1.36	-.06	-1.42	-3.01	-3.69	-4.29	-4.78	-4.93	-4.98	-5.00	-5.00	-5.00	-5.00	-5.00
60	10.00	3.57	1.89	-.04	-1.15	-2.70	-3.41	-4.09	-4.68	-4.88	-4.96	-5.00	-5.00	-5.00	-5.00	-5.00
70	10.00	3.59	1.91	.54	-1.01	-2.49	-3.20	-3.91	-4.58	-4.83	-4.94	-4.99	-5.00	-5.00	-5.00	-5.00
80	10.00	3.59	1.91	.84	-.88	-2.36	-3.04	-3.76	-4.47	-4.78	-4.91	-4.99	-5.00	-5.00	-5.00	-5.00
90	10.00	3.78	2.19	1.08	-.66	-2.21	-2.90	-3.63	-4.37	-4.72	-4.88	-4.98	-5.00	-5.00	-5.00	-5.00
100	10.00	4.00	2.46	1.24	-.44	-2.01	-2.74	-3.50	-4.28	-4.66	-4.85	-4.97	-5.00	-5.00	-5.00	-5.00
200	10.00	4.47	3.04	1.95	.57	-1.13	-1.81	-2.59	-3.51	-4.09	-4.46	-4.82	-4.95	-4.99	-5.00	-5.00
300	10.00	5.02	3.72	2.71	.89	-.32	-1.06	-1.93	-2.96	-3.64	-4.10	-4.63	-4.86	-4.96	-4.98	-5.00
400	10.00	5.09	3.81	2.81	1.31	-.15	-.86	-1.63	-2.60	-3.29	-3.79	-4.42	-4.74	-4.90	-4.95	-5.00
500	10.00	5.28	4.05	3.10	1.68	.24	-.52	-1.35	-2.35	-3.05	-3.57	-4.24	-4.62	-4.83	-4.91	-4.99
600	10.00	5.46	4.27	3.35	1.97	.28	-.23	-1.03	-2.06	-2.80	-3.34	-4.07	-4.50	-4.75	-4.86	-4.99
700	10.00	5.56	4.40	3.50	2.15	.31	-.03	-.80	-1.83	-2.58	-3.14	-3.92	-4.38	-4.67	-4.81	-4.98
800	10.00	5.61	4.46	3.56	2.22	.68	-.17	-.75	-1.68	-2.41	-2.97	-3.77	-4.27	-4.59	-4.76	-4.97
900	10.00	5.61	4.46	3.56	2.22	.81	.12	-.66	-1.60	-2.30	-2.85	-3.64	-4.16	-4.51	-4.70	-4.96
1000	10.00	5.61	4.46	3.56	2.22	.87	.37	-.51	-1.54	-2.22	-2.75	-3.54	-4.07	-4.43	-4.64	-4.94

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
10	10	-5.0	---

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 10 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5
1	10.00	7.92	6.18	4.73	3.40	2.15	.99	-.14	-1.47	-2.74	-3.65	-4.29	-4.90	-5.49	-6.05	-6.58
2	10.00	8.41	6.82	5.22	3.75	2.37	1.09	-.03	-.35	-.65	-1.17	-1.84	-2.48	-3.09	-3.68	-4.24
3	10.00	8.56	7.25	6.05	4.93	3.87	2.42	1.05	-.09	-.58	-1.05	-1.49	-1.91	-2.31	-2.70	-3.07
4	10.00	8.57	7.26	6.05	4.94	3.91	3.25	2.63	2.04	1.49	.96	.46	-.03	-.90	-1.73	-2.53
5	10.00	8.73	7.57	6.51	5.53	4.61	3.83	3.10	2.41	1.76	1.14	.55	-.02	-.63	-1.22	-1.78
6	10.00	8.80	7.71	6.71	5.78	4.91	4.08	3.30	2.57	1.87	1.21	.58	-.01	-.44	-.86	-1.25
7	10.00	8.85	7.81	6.85	5.96	5.12	4.26	3.44	2.67	1.95	1.26	.61	-.01	-.30	-.59	-.86
8	10.00	8.89	7.88	6.95	6.09	5.28	4.39	3.55	2.76	2.41	1.30	.62	-.01	-.19	-.37	-.55
9	10.00	8.92	7.94	7.03	6.20	5.41	4.49	3.63	2.82	2.06	1.33	.64	-.00	-.10	-.20	-.29
10	10.00	8.95	7.99	7.11	6.29	5.52	4.58	3.71	2.88	2.10	1.36	.65	-.00	-.02	-.05	-.07
20	10.00	9.09	8.25	7.49	6.78	6.12	5.50	4.93	4.38	3.87	3.38	2.92	2.47	2.05	1.65	1.26
30	10.00	9.16	8.40	7.70	7.05	6.44	5.87	5.34	4.84	4.37	3.86	3.33	2.83	2.35	1.88	1.44
40	10.00	9.20	8.47	7.79	7.17	6.59	6.05	5.54	5.06	4.60	4.17	3.76	3.37	3.00	2.64	2.29
50	10.00	9.21	8.50	7.84	7.22	6.66	6.13	5.63	5.16	4.71	4.29	3.90	3.52	3.16	2.81	2.48
60	10.00	9.26	8.58	7.96	7.38	6.85	6.35	5.88	5.43	5.01	4.61	4.24	3.88	3.53	3.20	2.89
70	10.00	9.28	8.62	8.02	7.46	6.94	6.45	6.00	5.57	5.16	4.77	4.41	4.06	3.72	3.40	3.09
80	10.00	9.30	8.66	8.07	7.52	7.01	6.54	6.09	5.67	5.27	4.89	4.54	4.19	3.87	3.55	3.25
90	10.00	9.31	8.68	8.10	7.57	7.07	6.61	6.17	5.76	5.36	4.99	4.64	4.31	3.99	3.68	3.39
100	10.00	9.32	8.71	8.14	7.61	7.12	6.66	6.23	5.83	5.44	5.08	4.73	4.40	4.09	3.79	3.50
200	10.00	9.39	8.84	8.33	7.85	7.41	7.00	6.61	6.25	5.90	5.58	5.26	4.97	4.68	4.41	4.15
300	10.00	9.43	8.90	8.42	7.98	7.56	7.17	6.81	6.46	6.14	5.83	5.54	5.26	4.99	4.73	4.49
400	10.00	9.44	8.94	8.47	8.04	7.63	7.26	6.90	6.57	6.26	5.96	5.67	5.40	5.14	4.89	4.65
500	10.00	9.46	8.97	8.52	8.11	7.72	7.36	7.01	6.69	6.39	6.10	5.83	5.56	5.31	5.07	4.84
600	10.00	9.48	9.00	8.56	8.16	7.78	7.42	7.09	6.78	6.48	6.20	5.93	5.68	5.44	5.20	4.98
700	10.00	9.49	9.02	8.59	8.19	7.82	7.48	7.15	6.84	6.55	6.28	6.01	5.76	5.53	5.30	5.08
800	10.00	9.50	9.04	8.61	8.22	7.86	7.52	7.20	6.89	6.61	6.34	6.08	5.83	5.60	5.37	5.16
900	10.00	9.50	9.05	8.63	8.25	7.89	7.55	7.24	6.94	6.66	6.39	6.14	5.89	5.66	5.44	5.23
1000	10.00	9.51	9.06	8.65	8.27	7.92	7.58	7.27	6.98	6.70	6.44	6.18	5.95	5.72	5.50	5.29

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU$_0$
10	10	-10.0	---

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 10 MJ/M^3

R

TAU	1.0	3.0	4.0	5.0	7.0	10.0	12.0	15.0	20.0	25.0	30.0	40.0	50.0	60.0	70.0	100.0
1	10.00	-8.16	-9.58	-9.91	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
2	10.00	-6.27	-8.61	-9.51	-9.96	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
3	10.00	-5.05	-7.70	-8.99	-9.86	-9.99	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
4	10.00	-4.44	-7.01	-8.48	-9.70	-9.98	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
5	10.00	-3.76	-6.46	-8.05	-9.52	-9.95	-9.99	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
6	10.00	-3.18	-5.95	-7.64	-9.33	-9.91	-9.98	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
7	10.00	-2.72	-5.49	-7.26	-9.12	-9.86	-9.97	-9.99	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
8	10.00	-2.36	-5.12	-6.92	-8.92	-9.80	-9.95	-9.99	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
9	10.00	-2.05	-4.79	-6.62	-8.72	-9.74	-9.93	-9.98	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
10	10.00	-1.78	-4.49	-6.34	-8.52	-9.66	-9.90	-9.98	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
20	10.00	-.42	-2.88	-4.68	-7.08	-8.87	-9.46	-9.81	-9.98	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
30	10.00	-.12	-1.92	-3.66	-6.10	-8.16	-8.96	-9.55	-9.91	-9.98	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
40	10.00	.24	-1.55	-3.07	-5.43	-7.59	-8.49	-9.25	-9.81	-9.95	-9.99	-10.00	-10.00	-10.00	-10.00	-10.00
50	10.00	1.32	-.89	-2.77	-5.03	-7.15	-8.09	-8.97	-9.68	-9.90	-9.97	-10.00	-10.00	-10.00	-10.00	-10.00
60	10.00	1.55	-.62	-2.28	-4.60	-6.78	-7.76	-8.70	-9.54	-9.83	-9.94	-9.99	-10.00	-10.00	-10.00	-10.00
70	10.00	1.67	-.45	-1.95	-4.24	-6.44	-7.45	-8.46	-9.39	-9.76	-9.91	-9.99	-10.00	-10.00	-10.00	-10.00
80	10.00	1.76	-.32	-1.69	-3.94	-6.15	-7.18	-8.23	-9.25	-9.68	-9.87	-9.98	-10.00	-10.00	-10.00	-10.00
90	10.00	1.83	-.22	-1.47	-3.70	-5.90	-6.93	-8.02	-9.10	-9.60	-9.83	-9.97	-10.00	-10.00	-10.00	-10.00
100	10.00	1.90	-.12	-1.28	-3.48	-5.67	-6.72	-7.83	-8.96	-9.51	-9.78	-9.96	-9.99	-10.00	-10.00	-10.00
200	10.00	2.99	1.18	-.22	-2.26	-4.33	-5.35	-6.52	-7.87	-8.71	-9.23	-9.75	-9.93	-9.98	-9.99	-10.00
300	10.00	3.39	1.39	-.07	-1.57	-3.57	-4.56	-5.73	-7.14	-8.08	-8.73	-9.47	-9.79	-9.94	-9.97	-10.00
400	10.00	3.59	1.91	.44	-1.25	-3.11	-4.07	-5.21	-6.62	-7.60	-8.31	-9.19	-9.63	-9.86	-9.93	-10.00
500	10.00	3.82	2.20	1.08	-.83	-2.78	-3.72	-4.85	-6.24	-7.23	-7.97	-8.93	-9.46	-9.76	-9.87	-9.99
600	10.00	3.98	2.41	1.21	-.61	-2.47	-3.40	-4.52	-5.91	-6.92	-7.67	-8.69	-9.29	-9.65	-9.81	-9.98
700	10.00	4.10	2.55	1.30	-.45	-2.23	-3.15	-4.25	-5.64	-6.65	-7.42	-8.48	-9.13	-9.54	-9.73	-9.97
800	10.00	4.20	2.68	1.38	-.31	-2.03	-2.94	-4.03	-5.40	-6.42	-7.19	-8.29	-8.97	-9.42	-9.66	-9.96
900	10.00	4.28	2.78	1.44	-.20	-1.86	-2.76	-3.84	-5.20	-6.21	-7.00	-8.11	-8.83	-9.31	-9.58	-9.94
1000	10.00	4.35	2.87	1.50	-.10	-1.71	-2.60	-3.67	-5.02	-6.04	-6.82	-7.95	-8.69	-9.20	-9.50	-9.92

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
10	10	-10.0	---

TEMPERATURES IN RADIAL HEAT FLOW
****

LATENT HEAT DENSITY, 10 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5
1	30.00	26.81	23.93	21.29	18.86	16.60	14.65	12.82	11.10	9.47	8.13	7.01	5.94	4.91	3.93	2.99
2	30.00	27.43	25.09	22.94	20.95	19.11	17.43	15.86	14.38	12.98	11.72	10.57	9.48	8.43	7.43	6.47
3	30.00	27.71	25.63	23.72	21.96	20.31	18.82	17.41	16.08	14.82	13.68	12.62	11.62	10.66	9.74	8.85
4	30.00	27.88	25.96	24.19	22.55	21.02	19.61	18.29	17.04	15.86	14.77	13.75	12.77	11.84	10.95	10.09
5	30.00	27.99	26.17	24.49	22.93	21.48	20.15	18.90	17.71	16.59	15.56	14.59	13.66	12.78	11.94	11.12
6	30.00	28.09	26.35	24.76	23.28	21.90	20.63	19.43	18.30	17.24	16.25	15.31	14.43	13.58	12.77	11.99
7	30.00	28.17	26.50	24.96	23.54	22.22	21.00	19.84	18.76	17.73	16.77	15.86	15.00	14.18	13.39	12.63
8	30.00	28.22	26.60	25.11	23.73	22.44	21.24	20.12	19.06	18.06	17.12	16.24	15.39	14.58	13.81	13.06
9	30.00	28.26	26.68	25.22	23.87	22.62	21.45	20.35	19.32	18.34	17.42	16.56	15.73	14.94	14.18	13.46
10	30.00	28.31	26.76	25.34	24.02	22.80	21.66	20.59	19.58	18.63	17.73	16.89	16.08	15.31	14.57	13.87
20	30.00	28.54	27.22	25.99	24.86	23.81	22.83	21.91	21.04	20.21	19.44	18.70	18.00	17.33	16.69	16.07
30	30.00	28.66	27.44	26.32	25.28	24.31	23.40	22.55	21.75	20.99	20.28	19.59	18.94	18.32	17.73	17.16
40	30.00	28.73	27.58	26.51	25.53	24.61	23.75	22.95	22.19	21.47	20.79	20.14	19.53	18.94	18.38	17.84
50	30.00	28.79	27.68	26.66	25.72	24.84	24.02	23.25	22.53	21.84	21.19	20.57	19.98	19.42	18.88	18.36
60	30.00	28.82	27.74	26.75	25.84	24.98	24.19	23.44	22.73	22.06	21.43	20.83	20.25	19.70	19.18	18.67
70	30.00	28.85	27.80	26.84	25.95	25.12	24.34	23.61	22.92	22.27	21.66	21.07	20.51	19.98	19.47	18.98
80	30.00	28.88	27.86	26.92	26.05	25.25	24.49	23.78	23.11	22.47	21.87	21.30	20.76	20.24	19.74	19.26
90	30.00	28.91	27.91	26.99	26.14	25.34	24.60	23.91	23.25	22.63	22.04	21.48	20.95	20.44	19.95	19.49
100	30.00	28.92	27.94	27.03	26.20	25.42	24.69	24.00	23.36	22.75	22.17	21.62	21.09	20.59	20.11	19.65
200	30.00	29.03	28.15	27.33	26.58	25.88	25.22	24.61	24.03	23.48	22.96	22.46	21.99	21.54	21.11	20.69
300	30.00	29.09	28.26	27.50	26.79	26.14	25.52	24.94	24.40	23.88	23.39	22.93	22.49	22.06	21.66	21.27
400	30.00	29.12	28.32	27.59	26.90	26.27	25.68	25.12	24.59	24.09	23.62	23.17	22.75	22.34	21.95	21.57
500	30.00	29.15	28.38	27.67	27.01	26.40	25.83	25.29	24.78	24.30	23.84	23.41	23.00	22.60	22.23	21.86
600	30.00	29.17	28.42	27.72	27.08	26.48	25.92	25.39	24.90	24.43	23.98	23.56	23.16	22.77	22.40	22.05
700	30.00	29.19	28.44	27.76	27.13	26.54	25.99	25.47	24.98	24.52	24.08	23.67	23.27	22.89	22.53	22.18
800	30.00	29.20	28.47	27.80	27.18	26.61	26.07	25.56	25.08	24.63	24.20	23.79	23.40	23.03	22.67	22.33
900	30.00	29.22	28.50	27.84	27.23	26.66	26.13	25.64	25.17	24.72	24.30	23.90	23.51	23.15	22.80	22.46
1000	30.00	29.23	28.52	27.87	27.27	26.71	26.18	25.69	25.23	24.79	24.37	23.98	23.60	23.24	22.89	22.56

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_c
10	30	-.01	---

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 10 MJ/M^3

R

TAU	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0
1	30.00	8.13	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
2	30.00	11.72	3.17	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
3	30.00	13.68	5.45	1.15	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
4	30.00	14.77	6.60	1.99	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
5	30.00	15.56	7.82	3.36	.41	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
6	30.00	16.25	8.75	4.16	1.34	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
7	30.00	16.77	9.41	4.69	2.05	.20	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
8	30.00	17.12	9.88	5.16	2.17	.35	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
9	30.00	17.42	10.35	5.79	2.90	.83	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
10	30.00	17.73	10.84	6.37	3.46	1.31	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
20	30.00	19.44	13.37	9.24	6.28	4.09	2.43	1.07	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01
30	30.00	20.28	14.63	10.71	7.76	5.47	3.63	2.30	1.20	.41	-.00	-.00	-.00	-.01	-.01	-.01
40	30.00	20.79	15.45	11.73	8.95	6.77	5.02	3.66	2.50	1.53	.69	-.00	-.00	-.00	-.00	-.01
50	30.00	21.19	16.06	12.47	9.74	7.57	5.78	4.31	3.04	2.14	1.46	.84	.27	-.00	-.00	-.00
60	30.00	21.43	16.43	12.92	10.25	8.11	6.35	4.94	3.72	2.77	2.00	1.29	.65	.07	-.00	-.00
70	30.00	21.66	16.80	13.39	10.79	8.72	7.01	5.53	4.44	3.47	2.65	1.90	1.22	.59	-.00	-.00
80	30.00	21.87	17.14	13.81	11.26	9.23	7.54	6.15	4.94	3.93	3.05	2.25	1.62	1.05	.52	.03
90	30.00	22.04	17.40	14.13	11.62	9.61	7.93	6.52	5.29	4.24	3.32	2.48	1.90	1.40	.93	.49
100	30.00	22.17	17.60	14.37	11.89	9.88	8.20	6.79	5.55	4.49	3.55	2.70	2.02	1.42	.86	.38
200	30.00	22.96	18.84	15.93	13.68	11.85	10.31	9.00	7.85	6.84	5.95	5.13	4.44	3.80	3.22	2.68
300	30.00	23.39	19.53	16.80	14.68	12.96	11.51	10.27	9.18	8.21	7.35	6.56	5.86	5.22	4.62	4.06
400	30.00	23.62	19.89	17.25	15.21	13.54	12.14	10.94	9.88	8.94	8.11	7.34	6.66	6.04	5.46	4.92
500	30.00	23.84	20.25	17.70	15.72	14.11	12.75	11.59	10.56	9.65	8.83	8.08	7.41	6.79	6.22	5.68
600	30.00	23.98	20.46	17.97	16.04	14.46	13.13	11.98	10.97	10.06	9.25	8.51	7.84	7.22	6.64	6.10
700	30.00	24.08	20.62	18.17	16.27	14.72	13.41	12.28	11.28	10.40	9.61	8.88	8.22	7.62	7.06	6.53
800	30.00	24.20	20.81	18.40	16.54	15.02	13.73	12.63	11.65	10.79	10.01	9.30	8.65	8.06	7.50	6.99
900	30.00	24.30	20.96	18.60	16.77	15.27	14.01	12.92	11.96	11.11	10.34	9.63	8.99	8.40	7.86	7.34
1000	30.00	24.37	21.08	18.75	16.94	15.46	14.21	13.14	12.19	11.34	10.58	9.88	9.24	8.66	8.11	7.60

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
10	30	-.01	---

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 10 MJ/M^3

R

TAU	1.0	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0	45.0	50.0	60.0	70.0	80.0	90.0	100.0
10	30.00	3.46	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
20	30.00	6.28	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
30	30.00	7.76	.41	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
40	30.00	8.95	1.53	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
50	30.00	9.74	2.14	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
60	30.00	10.25	2.77	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
70	30.00	10.79	3.47	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
80	30.00	11.26	3.93	.52	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
90	30.00	11.62	4.24	.93	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
100	30.00	11.89	4.49	.86	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
200	30.00	13.68	6.84	3.22	1.17	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
300	30.00	14.68	8.21	4.62	2.24	.87	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
400	30.00	15.21	8.94	5.46	3.21	1.73	.47	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01
500	30.00	15.72	9.65	6.22	3.91	2.26	1.08	.16	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01
600	30.00	16.04	10.06	6.64	4.29	2.56	1.29	.32	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01
700	30.00	16.27	10.40	7.06	4.79	3.18	2.02	1.10	.19	-.00	-.00	-.01	-.01	-.01	-.01	-.01
800	30.00	16.54	10.79	7.50	5.27	3.65	2.42	1.43	.58	-.00	-.00	-.01	-.01	-.01	-.01	-.01
900	30.00	16.77	11.11	7.86	5.62	3.96	2.68	1.63	.88	.21	-.00	-.00	-.01	-.01	-.01	-.01
1000	30.00	16.94	11.34	8.11	5.86	4.18	2.85	1.76	1.09	.51	-.00	-.00	-.01	-.01	-.01	-.01
2000	30.00	17.94	12.75	9.74	7.61	5.99	4.70	3.62	2.75	1.98	1.42	.49	-.00	-.00	-.00	-.01
3000	30.00	18.52	13.58	10.71	8.68	7.13	5.89	4.84	3.97	3.20	2.54	1.44	.70	.06	-.00	-.01

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_c
10	30	-.01	---

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 10 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5
1	30.00	26.45	23.24	20.31	17.61	15.10	12.97	10.96	9.08	7.29	5.11	2.67	.34	-.33	-.71	-1.07
2	30.00	27.07	24.40	21.96	19.70	17.61	15.73	13.97	12.31	10.74	9.33	8.05	6.83	5.67	4.56	3.49
3	30.00	27.45	25.12	22.98	21.01	19.17	17.49	15.91	14.42	13.01	11.71	10.51	9.36	8.26	7.21	6.21
4	30.00	27.58	25.37	23.34	21.47	19.72	18.11	16.60	15.17	13.82	12.58	11.41	10.31	9.25	8.24	7.26
5	30.00	27.73	25.66	23.76	22.01	20.37	18.87	17.45	16.12	14.86	13.69	12.61	11.58	10.59	9.64	8.73
6	30.00	27.86	25.91	24.11	22.45	20.91	19.48	18.14	16.87	15.68	14.57	13.53	12.54	11.59	10.68	9.81
7	30.00	27.95	26.07	24.35	22.76	21.28	19.90	18.61	17.39	16.23	15.15	14.13	13.16	12.23	11.34	10.49
8	30.00	27.99	26.16	24.47	22.91	21.46	20.11	18.83	17.63	16.50	15.43	14.42	13.45	12.53	11.64	10.79
9	30.00	28.02	26.22	24.56	23.02	21.59	20.26	19.01	17.83	16.72	15.67	14.68	13.74	12.84	11.98	11.15
10	30.00	28.07	26.32	24.70	23.20	21.81	20.52	19.31	18.16	17.08	16.06	15.11	14.19	13.32	12.49	11.69
20	30.00	28.34	26.83	25.44	24.15	22.95	21.83	20.78	19.79	18.85	17.97	17.13	16.33	15.57	14.84	14.14
30	30.00	28.50	27.14	25.88	24.72	23.64	22.63	21.68	20.78	19.94	19.14	18.38	17.65	16.96	16.29	15.66
40	30.00	28.56	27.24	26.02	24.90	23.85	22.88	21.96	21.09	20.28	19.50	18.77	18.06	17.39	16.75	16.13
50	30.00	28.63	27.38	26.23	25.16	24.17	23.25	22.38	21.55	20.78	20.04	19.35	18.68	18.05	17.44	16.85
60	30.00	28.69	27.49	26.38	25.36	24.41	23.52	22.68	21.90	21.15	20.44	19.77	19.13	18.52	17.94	17.38
70	30.00	28.71	27.53	26.45	25.45	24.51	23.64	22.82	22.05	21.32	20.62	19.96	19.34	18.73	18.16	17.61
80	30.00	28.72	27.56	26.49	25.50	24.57	23.71	22.90	22.14	21.41	20.73	20.08	19.45	18.86	18.29	17.75
90	30.00	28.76	27.62	26.58	25.61	24.71	23.87	23.08	22.33	21.62	20.96	20.32	19.72	19.14	18.58	18.05
100	30.00	28.79	27.68	26.66	25.71	24.84	24.01	23.24	22.51	21.83	21.17	20.55	19.96	19.40	18.86	18.34
200	30.00	28.91	27.92	27.01	26.16	25.38	24.64	23.95	23.30	22.68	22.10	21.55	21.02	20.51	20.02	19.56
300	30.00	28.96	28.02	27.15	26.34	25.59	24.89	24.23	23.61	23.03	22.47	21.94	21.43	20.95	20.49	20.04
400	30.00	29.02	28.12	27.30	26.54	25.83	25.16	24.54	23.95	23.40	22.87	22.37	21.89	21.43	20.99	20.57
500	30.00	29.05	28.18	27.38	26.64	25.95	25.31	24.71	24.13	23.60	23.08	22.60	22.13	21.69	21.26	20.86
600	30.00	29.06	28.20	27.41	26.68	25.99	25.36	24.76	24.19	23.66	23.15	22.67	22.21	21.77	21.35	20.95
700	30.00	29.09	28.25	27.48	26.77	26.11	25.49	24.91	24.36	23.84	23.35	22.88	22.44	22.01	21.60	21.21
800	30.00	29.11	28.29	27.54	26.85	26.20	25.60	25.03	24.50	23.99	23.51	23.05	22.62	22.20	21.80	21.42
900	30.00	29.12	28.32	27.58	26.90	26.27	25.67	25.11	24.59	24.09	23.62	23.17	22.74	22.33	21.94	21.56
1000	30.00	29.13	28.33	27.60	26.92	26.29	25.70	25.14	24.62	24.13	23.66	23.21	22.78	22.38	21.99	21.61

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
10	30	-5.0	---

TEMPERATURES IN RADIAL HEAT FLOW

LATENT HEAT DENSITY, 10 MJ/M^3

R

TAU	1.0	3.0	4.0	5.0	7.0	10.0	12.0	15.0	20.0	25.0	30.0	40.0	50.0	60.0	70.0	100.0
1	30.00	-2.68	-4.42	-4.88	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
2	30.00	-.43	-3.13	-4.35	-4.95	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
3	30.00	1.81	-1.99	-3.61	-4.81	-4.99	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
4	30.00	3.88	-.99	-3.03	-4.61	-4.97	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
5	30.00	4.71	-.38	-2.24	-4.36	-4.94	-4.99	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
6	30.00	6.22	-.33	-1.91	-4.06	-4.88	-4.98	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
7	30.00	6.82	1.35	-1.34	-3.77	-4.81	-4.96	-4.99	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
8	30.00	7.07	2.55	-.52	-3.54	-4.73	-4.93	-4.99	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
9	30.00	7.62	2.87	-.41	-3.30	-4.64	-4.90	-4.98	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
10	30.00	8.28	3.22	-.28	-3.01	-4.55	-4.86	-4.97	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
20	30.00	11.06	6.38	3.15	-1.00	-3.47	-4.27	-4.74	-4.97	-4.99	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
30	30.00	12.84	8.47	5.19	-.06	-2.40	-3.53	-4.37	-4.88	-4.97	-4.99	-5.00	-5.00	-5.00	-5.00	-5.00
40	30.00	13.41	9.16	5.99	1.80	-1.75	-2.97	-3.98	-4.73	-4.92	-4.98	-5.00	-5.00	-5.00	-5.00	-5.00
50	30.00	14.27	10.24	7.21	2.31	-.77	-2.27	-3.55	-4.55	-4.86	-4.96	-5.00	-5.00	-5.00	-5.00	-5.00
60	30.00	14.68	10.98	8.00	3.63	-.71	-1.79	-3.14	-4.35	-4.77	-4.92	-4.99	-5.00	-5.00	-5.00	-5.00
70	30.00	15.15	11.28	8.29	3.83	.26	-1.52	-2.86	-4.14	-4.66	-4.88	-4.98	-5.00	-5.00	-5.00	-5.00
80	30.00	15.32	11.51	8.61	4.38	.61	-1.12	-2.58	-3.95	-4.56	-4.82	-4.97	-5.00	-5.00	-5.00	-5.00
90	30.00	15.69	11.98	9.16	5.05	.71	-.63	-2.20	-3.75	-4.44	-4.76	-4.96	-4.99	-5.00	-5.00	-5.00
100	30.00	16.03	12.41	9.64	5.59	.80	-.21	-1.83	-3.54	-4.32	-4.70	-4.94	-4.99	-5.00	-5.00	-5.00
200	30.00	17.49	14.23	11.71	7.98	4.03	1.74	-.10	-1.87	-3.14	-3.91	-4.65	-4.90	-4.98	-4.99	-5.00
300	30.00	18.06	14.94	12.53	8.90	5.14	3.27	1.44	-1.00	-2.35	-3.22	-4.24	-4.71	-4.91	-4.96	-5.00
400	30.00	18.70	15.75	13.46	10.04	6.49	4.71	2.10	-.04	-1.41	-2.51	-3.83	-4.47	-4.80	-4.90	-5.00
500	30.00	19.04	16.17	13.95	10.60	7.07	5.27	3.09	.48	-1.05	-2.08	-3.44	-4.21	-4.65	-4.82	-4.99
600	30.00	19.15	16.31	14.11	10.81	7.35	5.61	3.54	1.20	-.54	-1.71	-3.15	-3.98	-4.50	-4.72	-4.98
700	30.00	19.46	16.71	14.57	11.37	8.01	6.31	4.30	1.51	-.22	-1.16	-2.80	-3.75	-4.34	-4.62	-4.96
800	30.00	19.72	17.02	14.94	11.81	8.52	6.85	4.86	2.37	-.27	-1.05	-2.44	-3.50	-4.17	-4.51	-4.94
900	30.00	19.88	17.23	15.18	12.09	8.83	7.17	5.15	2.58	.28	-.76	-2.21	-3.27	-3.99	-4.39	-4.91
1000	30.00	19.95	17.31	15.27	12.19	8.94	7.27	5.25	2.64	.95	-.36	-2.07	-3.10	-3.83	-4.27	-4.88

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
10	30	-5.0	---

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 10 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5
1	30.00	25.88	22.16	18.78	15.65	12.76	10.60	8.58	6.67	4.86	3.14	1.51	-.04	-1.34	-2.58	-3.77
2	30.00	26.80	23.88	21.21	18.73	16.43	14.34	12.38	10.53	8.78	6.96	5.11	3.35	1.66	.05	-.62
3	30.00	27.05	24.36	21.90	19.62	17.50	15.58	13.77	12.07	10.46	9.05	7.81	6.63	5.50	4.42	3.38
4	30.00	27.33	24.90	22.66	20.60	18.67	16.91	15.25	13.69	12.21	10.73	9.26	7.86	6.52	5.24	4.01
5	30.00	27.50	25.22	23.12	21.19	19.38	17.72	16.15	14.68	13.28	11.98	10.77	9.61	8.50	7.44	6.43
6	30.00	27.58	25.36	23.33	21.44	19.69	18.05	16.52	15.07	13.70	12.40	11.18	10.01	8.89	7.82	6.79
7	30.00	27.63	25.46	23.47	21.63	19.91	18.33	16.84	15.43	14.10	12.87	11.70	10.60	9.54	8.53	7.56
8	30.00	27.72	25.65	23.74	21.97	20.33	18.81	17.38	16.03	14.76	13.57	12.45	11.38	10.36	9.39	8.45
9	30.00	27.80	25.80	23.96	22.26	20.67	19.20	17.81	16.51	15.28	14.12	13.04	12.00	11.01	10.06	9.15
10	30.00	27.87	25.93	24.14	22.49	20.95	19.52	18.17	16.91	15.71	14.58	13.52	12.51	11.55	10.62	9.73
20	30.00	28.15	26.47	24.92	23.49	22.15	20.91	19.74	18.64	17.59	16.61	15.68	14.79	13.94	13.13	12.35
30	30.00	28.32	26.78	25.36	24.05	22.84	21.70	20.63	19.62	18.66	17.76	16.90	16.08	15.30	14.55	13.83
40	30.00	28.38	26.90	25.53	24.27	23.10	22.00	20.97	20.00	19.09	18.22	17.39	16.61	15.85	15.14	14.45
50	30.00	28.46	27.06	25.77	24.58	23.47	22.43	21.45	20.54	19.67	18.84	18.06	17.31	16.60	15.92	15.26
60	30.00	28.52	27.17	25.93	24.78	23.71	22.71	21.77	20.89	20.05	19.25	18.50	17.78	17.09	16.43	15.80
70	30.00	28.55	27.22	26.01	24.88	23.83	22.84	21.92	21.05	20.23	19.45	18.70	18.00	17.32	16.67	16.05
80	30.00	28.56	27.24	26.03	24.91	23.87	22.89	21.98	21.11	20.30	19.52	18.79	18.09	17.41	16.77	16.16
90	30.00	28.60	27.32	26.15	25.06	24.05	23.10	22.21	21.37	20.58	19.82	19.11	18.43	17.78	17.15	16.56
100	30.00	28.63	27.39	26.24	25.18	24.19	23.26	22.39	21.58	20.80	20.07	19.37	18.70	18.07	17.46	16.87
200	30.00	28.77	27.65	26.62	25.66	24.77	23.94	23.16	22.42	21.73	21.07	20.44	19.84	19.27	18.72	18.19
300	30.00	28.85	27.80	26.84	25.95	25.12	24.34	23.61	22.92	22.27	21.65	21.07	20.51	19.97	19.46	18.97
400	30.00	28.89	27.87	26.93	26.06	25.26	24.50	23.79	23.13	22.49	21.89	21.32	20.78	20.26	19.76	19.29
500	30.00	28.93	27.95	27.05	26.22	25.44	24.72	24.04	23.40	22.79	22.21	21.66	21.14	20.64	20.16	19.71
600	30.00	28.96	28.01	27.13	26.32	25.57	24.86	24.20	23.57	22.98	22.42	21.89	21.38	20.89	20.43	19.98
700	30.00	28.97	28.02	27.15	26.35	25.60	24.90	24.24	23.62	23.03	22.47	21.94	21.44	20.96	20.49	20.05
800	30.00	28.98	28.05	27.19	26.40	25.66	24.97	24.32	23.71	23.13	22.59	22.06	21.57	21.09	20.64	20.20
900	30.00	29.00	28.09	27.26	26.48	25.76	25.09	24.45	23.85	23.29	22.75	22.24	21.76	21.29	20.85	20.42
1000	30.00	29.02	28.13	27.30	26.54	25.83	25.17	24.54	23.96	23.40	22.87	22.37	21.89	21.44	21.00	20.58

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
10	30	-10.0	---

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 10 MJ/M^3

R

TAU	1.0	3.0	4.0	5.0	7.0	10.0	12.0	15.0	20.0	25.0	30.0	40.0	50.0	60.0	70.0	100.0
1	30.00	-6.69	-9.25	-9.84	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
2	30.00	-3.47	-7.41	-9.09	-9.93	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
3	30.00	-1.06	-5.93	-8.19	-9.75	-9.99	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
4	30.00	-.36	-4.39	-7.21	-9.46	-9.96	-9.99	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
5	30.00	-.06	-3.54	-6.30	-9.12	-9.91	-9.98	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
6	30.00	3.31	-2.35	-5.67	-8.75	-9.84	-9.97	-9.99	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
7	30.00	4.05	-1.62	-5.07	-8.38	-9.75	-9.94	-9.99	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
8	30.00	4.55	-1.16	-4.39	-8.02	-9.64	-9.91	-9.98	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
9	30.00	4.94	-.77	-3.76	-7.66	-9.52	-9.87	-9.97	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
10	30.00	5.26	-.41	-3.16	-7.28	-9.39	-9.81	-9.96	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
20	30.00	8.95	3.54	-.39	-4.57	-7.92	-9.02	-9.66	-9.95	-9.99	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
30	30.00	10.64	5.63	1.51	-2.82	-6.55	-8.05	-9.16	-9.83	-9.96	-9.99	-10.00	-10.00	-10.00	-10.00	-10.00
40	30.00	11.40	6.68	3.31	-1.59	-5.61	-7.24	-8.63	-9.64	-9.90	-9.98	-10.00	-10.00	-10.00	-10.00	-10.00
50	30.00	12.36	7.83	4.02	-.64	-4.64	-6.46	-8.09	-9.40	-9.81	-9.94	-10.00	-10.00	-10.00	-10.00	-10.00
60	30.00	13.00	8.62	5.29	-.78	-3.82	-5.74	-7.56	-9.14	-9.69	-9.90	-9.99	-10.00	-10.00	-10.00	-10.00
70	30.00	13.28	8.91	5.53	.85	-3.40	-5.22	-7.10	-8.86	-9.55	-9.84	-9.98	-10.00	-10.00	-10.00	-10.00
80	30.00	13.42	9.13	5.87	1.73	-3.01	-4.84	-6.72	-8.59	-9.41	-9.76	-9.97	-10.00	-10.00	-10.00	-10.00
90	30.00	13.90	9.73	6.56	2.02	-2.40	-4.35	-6.34	-8.33	-9.26	-9.68	-9.95	-9.99	-10.00	-10.00	-10.00
100	30.00	14.28	10.20	7.08	2.24	-1.87	-3.87	-5.96	-8.08	-9.10	-9.59	-9.93	-9.99	-10.00	-10.00	-10.00
200	30.00	15.85	12.16	9.32	5.10	.72	-1.24	-3.48	-6.04	-7.60	-8.57	-9.53	-9.86	-9.97	-9.99	-10.00
300	30.00	16.77	13.31	10.63	6.60	2.13	-.34	-2.05	-4.56	-6.36	-7.59	-9.00	-9.61	-9.88	-9.95	-10.00
400	30.00	17.16	13.80	11.21	7.33	3.34	1.44	-.95	-3.70	-5.54	-6.84	-8.47	-9.30	-9.73	-9.87	-10.00
500	30.00	17.66	14.43	11.94	8.18	4.13	1.78	-.35	-2.79	-4.73	-6.15	-7.98	-8.98	-9.55	-9.76	-9.99
600	30.00	17.99	14.85	12.41	8.75	4.90	2.95	-.39	-2.20	-4.07	-5.54	-7.52	-8.66	-9.34	-9.64	-9.97
700	30.00	18.07	14.95	12.52	8.87	5.00	3.02	1.06	-1.83	-3.71	-5.12	-7.11	-8.34	-9.12	-9.50	-9.95
800	30.00	18.25	15.18	12.80	9.22	5.48	3.59	1.58	-1.31	-3.31	-4.76	-6.78	-8.06	-8.91	-9.35	-9.92
900	30.00	18.52	15.51	13.18	9.68	6.00	4.13	1.83	-.90	-2.83	-4.33	-6.45	-7.80	-8.70	-9.20	-9.88
1000	30.00	18.70	15.75	13.46	10.01	6.38	4.54	2.02	-.57	-2.42	-3.95	-6.13	-7.54	-8.50	-9.06	-9.84

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
10	30	-10.0	---

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 100 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5
4	10.00	8.57	7.26	6.05	4.94	3.90	2.99	2.13	1.33	.56	-.00	-.00	-.00	-.00	-.00	-.00
5	10.00	8.57	7.26	6.05	4.94	3.91	3.16	2.46	1.80	1.17	.58	.02	-.00	-.00	-.00	-.00
6	10.00	8.59	7.32	6.17	5.11	4.13	3.35	2.63	1.94	1.29	.79	.38	.00	-.00	-.00	-.00
7	10.00	8.89	7.88	6.96	6.11	5.32	4.62	3.97	3.35	2.77	2.04	1.23	.45	-.00	-.00	-.00
8	10.00	8.96	8.00	7.13	6.32	5.57	4.87	4.22	3.60	3.02	2.34	1.60	.90	.23	-.00	-.00
9	10.00	8.97	8.03	7.16	6.36	5.61	4.92	4.26	3.65	3.06	2.44	1.81	1.20	.62	.06	-.00
10	10.00	8.97	8.03	7.17	6.37	5.62	4.93	4.27	3.66	3.07	2.50	1.94	1.41	.90	.41	-.00
20	10.00	9.19	8.45	7.76	7.13	6.54	6.00	5.48	5.00	4.54	4.11	3.70	3.31	2.94	2.59	2.24
30	10.00	9.20	8.47	7.79	7.17	6.59	6.05	5.54	5.06	4.60	4.17	3.76	3.37	3.00	2.64	2.29
40	10.00	9.29	8.64	8.04	7.49	6.97	6.50	6.05	5.63	5.23	4.87	4.52	4.19	3.88	3.58	3.29
50	10.00	9.34	8.74	8.19	7.68	7.20	6.75	6.34	5.94	5.57	5.22	4.88	4.56	4.25	3.96	3.68
60	10.00	9.34	8.74	8.19	7.68	7.21	6.76	6.34	5.95	5.58	5.22	4.89	4.57	4.26	3.97	3.69
70	10.00	9.34	8.74	8.19	7.68	7.21	6.76	6.34	5.95	5.58	5.22	4.89	4.57	4.26	3.97	3.69
80	10.00	9.35	8.75	8.20	7.69	7.22	6.78	6.36	5.97	5.61	5.26	4.93	4.62	4.32	4.03	3.76
90	10.00	9.42	8.90	8.41	7.97	7.55	7.16	6.80	6.45	6.13	5.82	5.53	5.25	4.99	4.73	4.49
100	10.00	9.44	8.93	8.46	8.03	7.62	7.24	6.89	6.55	6.23	5.93	5.65	5.38	5.12	4.87	4.63
200	10.00	9.51	9.07	8.66	8.29	7.93	7.61	7.30	7.01	6.73	6.47	6.22	5.98	5.76	5.54	5.33
300	10.00	9.52	9.08	8.67	8.30	7.95	7.62	7.32	7.03	6.75	6.49	6.25	6.01	5.79	5.57	5.36
400	10.00	9.57	9.18	8.82	8.49	8.18	7.89	7.62	7.36	7.12	6.89	6.67	6.46	6.26	6.07	5.89
500	10.00	9.57	9.19	8.83	8.50	8.19	7.90	7.63	7.37	7.13	6.90	6.69	6.48	6.28	6.09	5.91
600	10.00	9.57	9.19	8.83	8.50	8.19	7.90	7.63	7.37	7.13	6.90	6.69	6.48	6.28	6.09	5.91
700	10.00	9.61	9.25	8.91	8.61	8.32	8.06	7.81	7.57	7.35	7.13	6.93	6.74	6.56	6.38	6.21
800	10.00	9.62	9.27	8.95	8.65	8.38	8.12	7.87	7.65	7.43	7.22	7.03	6.84	6.66	6.49	6.33
900	10.00	9.62	9.27	8.95	8.65	8.38	8.12	7.88	7.65	7.43	7.23	7.03	6.85	6.67	6.50	6.34
1000	10.00	9.62	9.27	8.95	8.65	8.38	8.12	7.88	7.65	7.43	7.23	7.03	6.85	6.67	6.50	6.34

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
100	10	-.01	---

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 100 MJ/M^3

R

TAU	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0
1	10.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
2	10.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
3	10.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
4	10.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
5	10.00	.58	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
6	10.00	.79	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
7	10.00	2.04	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
8	10.00	2.34	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
9	10.00	2.44	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
10	10.00	2.50	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
20	10.00	4.11	.13	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
30	10.00	4.17	1.02	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
40	10.00	4.87	2.10	-.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
50	10.00	5.22	2.42	.15	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
60	10.00	5.22	2.43	.54	-.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
70	10.00	5.22	2.43	.76	-.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
80	10.00	5.26	2.60	.99	-.00	-.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01
90	10.00	5.82	3.42	1.78	-.00	-.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01
100	10.00	5.93	3.56	1.89	.28	-.00	-.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01
200	10.00	6.47	4.41	2.95	1.83	.76	-.00	-.00	-.00	-.00	-.00	-.00	-.00	-.01	-.01	-.01
300	10.00	6.49	4.44	2.99	1.86	1.03	.45	-.00	-.00	-.00	-.00	-.00	-.00	-.00	-.00	-.01
400	10.00	6.89	5.07	3.78	2.79	1.98	1.29	.52	-.00	-.00	-.00	-.00	-.00	-.00	-.00	-.00
500	10.00	6.90	5.09	3.81	2.81	2.00	1.31	.74	.25	-.00	-.00	-.00	-.00	-.00	-.00	-.00
600	10.00	6.90	5.09	3.81	2.81	2.00	1.31	.83	.45	.10	-.00	-.00	-.00	-.00	-.00	-.00
700	10.00	7.13	5.46	4.28	3.38	2.66	2.05	1.54	1.10	.53	-.00	-.00	-.00	-.00	-.00	-.00
800	10.00	7.22	5.60	4.45	3.55	2.83	2.21	1.68	1.21	.71	.21	-.00	-.00	-.00	-.00	-.00
900	10.00	7.23	5.61	4.46	3.56	2.84	2.22	1.69	1.21	.78	.38	.01	-.00	-.00	-.00	-.00
1000	10.00	7.23	5.61	4.46	3.56	2.84	2.22	1.69	1.21	.82	.48	.17	-.00	-.00	-.00	-.00

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
100	10	-.01	---

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 100 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5
1	10.00	7.63	4.99	2.09	-.09	-.46	-.82	-1.15	-1.46	-1.75	-2.05	-2.36	-2.65	-2.92	-3.19	-3.44
2	10.00	7.63	5.65	4.00	2.47	1.05	-.09	-.50	-.88	-1.24	-1.54	-1.78	-2.02	-2.24	-2.46	-2.67
3	10.00	8.19	6.54	5.01	3.59	2.28	1.04	-.02	-.18	-.34	-.60	-.93	-1.25	-1.55	-1.84	-2.11
4	10.00	8.56	7.24	6.03	4.92	3.84	2.19	.63	-.13	-.35	-.55	-.75	-.93	-1.11	-1.28	-1.45
5	10.00	8.57	7.26	6.05	4.94	3.88	2.60	1.40	.27	-.16	-.37	-.57	-.75	-.93	-1.10	-1.27
6	10.00	8.57	7.26	6.05	4.94	3.89	2.85	1.87	.94	.07	-.20	-.41	-.61	-.81	-.99	-1.16
7	10.00	8.57	7.26	6.05	4.94	3.90	3.02	2.19	1.40	.66	-.01	-.25	-.47	-.69	-.89	-1.09
8	10.00	8.57	7.26	6.05	4.94	3.91	3.13	2.40	1.72	1.07	.45	-.06	-.32	-.56	-.80	-1.03
9	10.00	8.57	7.26	6.05	4.94	3.91	3.22	2.57	1.95	1.37	.82	.23	-.13	-.42	-.70	-.97
10	10.00	8.67	7.47	6.37	5.36	4.42	3.67	2.97	2.31	1.68	1.09	.52	-.01	-.24	-.47	-.69
20	10.00	8.97	8.03	7.17	6.37	5.63	4.93	4.27	3.66	3.07	2.53	2.01	1.52	1.04	.59	.16
30	10.00	9.07	8.22	7.45	6.73	6.06	5.45	4.87	4.33	3.82	3.33	2.88	2.44	2.03	1.63	1.25
40	10.00	9.20	8.47	7.79	7.17	6.59	6.05	5.54	5.06	4.60	4.17	3.76	3.37	2.99	2.64	2.29
50	10.00	9.20	8.47	7.79	7.17	6.59	6.05	5.54	5.06	4.60	4.17	3.76	3.37	3.00	2.64	2.30
60	10.00	9.20	8.47	7.79	7.17	6.59	6.05	5.54	5.06	4.60	4.17	3.76	3.37	3.00	2.64	2.30
70	10.00	9.20	8.47	7.79	7.17	6.59	6.05	5.54	5.06	4.60	4.17	3.76	3.37	3.00	2.64	2.30
80	10.00	9.28	8.63	8.03	7.47	6.95	6.47	6.01	5.59	5.18	4.80	4.44	4.10	3.77	3.46	3.16
90	10.00	9.34	8.73	8.17	7.66	7.18	6.73	6.31	5.91	5.54	5.18	4.84	4.52	4.22	3.92	3.64
100	10.00	9.34	8.74	8.19	7.68	7.21	6.76	6.34	5.95	5.58	5.22	4.89	4.57	4.26	3.97	3.69
200	10.00	9.41	8.87	8.38	7.92	7.50	7.10	6.73	6.37	6.04	5.72	5.42	5.14	4.87	4.60	4.35
300	10.00	9.44	8.94	8.47	8.04	7.63	7.26	6.90	6.57	6.26	5.96	5.67	5.40	5.14	4.89	4.65
400	10.00	9.44	8.94	8.47	8.04	7.63	7.26	6.90	6.57	6.26	5.96	5.67	5.40	5.14	4.89	4.65
500	10.00	9.50	9.05	8.63	8.24	7.88	7.55	7.23	6.93	6.65	6.38	6.13	5.89	5.66	5.43	5.22
600	10.00	9.52	9.08	8.67	8.30	7.95	7.62	7.32	7.03	6.75	6.49	6.25	6.01	5.79	5.57	5.36
700	10.00	9.52	9.08	8.67	8.30	7.95	7.62	7.32	7.03	6.75	6.49	6.25	6.01	5.79	5.57	5.36
800	10.00	9.52	9.08	8.67	8.30	7.95	7.62	7.32	7.03	6.75	6.49	6.25	6.01	5.79	5.57	5.36
900	10.00	9.52	9.08	8.67	8.30	7.95	7.62	7.32	7.03	6.75	6.49	6.25	6.01	5.79	5.57	5.36
1000	10.00	9.54	9.12	8.74	8.38	8.05	7.74	7.45	7.18	6.92	6.67	6.44	6.22	6.00	5.80	5.60

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
100	10	-5.0	---

TEMPERATURES IN RADIAL HEAT FLOW

LATENT HEAT DENSITY, 100 MJ/M^3

R

TAU	1.0	3.0	4.0	5.0	7.0	10.0	12.0	15.0	20.0	25.0	30.0	40.0	50.0	60.0	70.0	100.0
1	10.00	-4.18	-4.83	-4.96	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
2	10.00	-3.46	-4.41	-4.79	-4.98	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
3	10.00	-3.00	-4.07	-4.58	-4.94	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
4	10.00	-2.39	-3.68	-4.35	-4.88	-4.99	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
5	10.00	-2.13	-3.39	-4.13	-4.80	-4.98	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
6	10.00	-1.98	-3.18	-3.94	-4.71	-4.96	-4.99	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
7	10.00	-1.86	-3.02	-3.78	-4.61	-4.94	-4.99	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
8	10.00	-1.78	-2.90	-3.65	-4.52	-4.91	-4.98	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
9	10.00	-1.71	-2.80	-3.55	-4.44	-4.89	-4.97	-4.99	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
10	10.00	-1.54	-2.69	-3.45	-4.36	-4.85	-4.96	-4.99	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
20	10.00	-.64	-1.73	-2.53	-3.64	-4.48	-4.76	-4.92	-4.99	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
30	10.00	-.15	-1.27	-2.14	-3.25	-4.17	-4.53	-4.79	-4.96	-4.99	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
40	10.00	-.00	-.81	-1.59	-2.80	-3.87	-4.30	-4.66	-4.91	-4.98	-4.99	-5.00	-5.00	-5.00	-5.00	-5.00
50	10.00	.64	-.69	-1.44	-2.56	-3.63	-4.09	-4.52	-4.85	-4.95	-4.99	-5.00	-5.00	-5.00	-5.00	-5.00
60	10.00	.98	-.59	-1.35	-2.41	-3.45	-3.92	-4.38	-4.78	-4.92	-4.97	-5.00	-5.00	-5.00	-5.00	-5.00
70	10.00	1.19	-.46	-1.29	-2.30	-3.31	-3.79	-4.27	-4.71	-4.89	-4.96	-4.99	-5.00	-5.00	-5.00	-5.00
80	10.00	1.71	-.12	-.85	-2.09	-3.18	-3.67	-4.16	-4.64	-4.85	-4.94	-4.99	-5.00	-5.00	-5.00	-5.00
90	10.00	2.39	-.16	-.71	-1.80	-2.99	-3.52	-4.05	-4.57	-4.81	-4.92	-4.99	-5.00	-5.00	-5.00	-5.00
100	10.00	2.43	-.08	-.64	-1.69	-2.84	-3.38	-3.94	-4.50	-4.77	-4.90	-4.98	-5.00	-5.00	-5.00	-5.00
200	10.00	3.24	1.31	-.03	-.94	-2.12	-2.67	-3.28	-3.95	-4.37	-4.62	-4.88	-4.96	-4.99	-5.00	-5.00
300	10.00	3.59	1.91	.54	-.67	-1.68	-2.19	-2.79	-3.53	-4.02	-4.36	-4.73	-4.90	-4.97	-4.99	-5.00
400	10.00	3.59	1.91	.88	-.55	-1.54	-2.01	-2.58	-3.28	-3.78	-4.14	-4.59	-4.81	-4.93	-4.97	-5.00
500	10.00	4.27	2.78	1.64	-.23	-1.03	-1.59	-2.24	-3.03	-3.57	-3.96	-4.45	-4.72	-4.88	-4.94	-5.00
600	10.00	4.44	2.99	1.86	-.11	-.91	-1.42	-2.03	-2.80	-3.36	-3.77	-4.32	-4.64	-4.82	-4.90	-4.99
700	10.00	4.44	2.99	1.86	.07	-.86	-1.34	-1.93	-2.67	-3.21	-3.63	-4.20	-4.55	-4.76	-4.86	-4.99
800	10.00	4.44	2.99	1.86	.32	-.83	-1.29	-1.85	-2.57	-3.10	-3.51	-4.10	-4.46	-4.70	-4.82	-4.98
900	10.00	4.44	2.99	1.86	.48	-.80	-1.25	-1.80	-2.49	-3.01	-3.42	-4.01	-4.38	-4.64	-4.78	-4.97
1000	10.00	4.73	3.36	2.30	.72	-.56	-1.07	-1.67	-2.40	-2.93	-3.34	-3.93	-4.31	-4.58	-4.74	-4.96

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
100	10	-5.0	---

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 100 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5
1	10.00	6.37	3.05	-.00	-.06	-.16	-1.18	-2.14	-3.05	-3.91	-4.61	-5.19	-5.75	-6.28	-6.79	-7.28
2	10.00	7.63	5.17	2.62	.27	-.54	-1.12	-1.66	-2.16	-2.65	-3.14	-3.64	-4.12	-4.58	-5.02	-5.44
3	10.00	7.63	5.61	3.88	2.29	.80	-.30	-.97	-1.60	-2.20	-2.71	-3.15	-3.57	-3.97	-4.35	-4.72
4	10.00	7.74	5.95	4.56	3.27	2.07	.95	-.10	-1.02	-1.89	-2.49	-2.89	-3.27	-3.63	-3.98	-4.31
5	10.00	8.26	6.62	5.08	3.64	2.31	1.06	-.04	-.43	-.80	-1.25	-1.74	-2.21	-2.65	-3.08	-3.49
6	10.00	8.38	6.78	5.20	3.73	2.36	1.08	-.01	-.15	-.27	-.61	-1.10	-1.56	-2.00	-2.42	-2.83
7	10.00	8.51	7.16	5.93	4.79	3.68	1.74	-.02	-.37	-.70	-1.02	-1.32	-1.61	-1.89	-2.15	-2.40
8	10.00	8.56	7.25	6.05	4.93	3.86	2.14	.53	-.23	-.55	-.86	-1.16	-1.44	-1.71	-1.97	-2.22
9	10.00	8.57	7.26	6.05	4.94	3.87	2.41	1.04	-.07	-.40	-.72	-1.02	-1.31	-1.58	-1.84	-2.10
10	10.00	8.57	7.26	6.05	4.94	3.88	2.62	1.44	.32	-.24	-.57	-.88	-1.18	-1.47	-1.74	-2.00
20	10.00	8.79	7.69	6.67	5.74	4.86	4.04	3.27	2.54	1.85	1.20	.58	-.01	-.32	-.63	-.92
30	10.00	8.91	7.91	6.99	6.14	5.34	4.44	3.59	2.79	2.03	1.31	.63	-.00	-.02	-.03	-.04
40	10.00	8.97	8.03	7.17	6.37	5.63	4.93	4.27	3.66	3.07	2.43	1.75	1.10	.48	-.04	-.25
50	10.00	8.97	8.03	7.17	6.37	5.63	4.93	4.27	3.66	3.07	2.56	2.09	1.65	1.22	.81	.42
60	10.00	8.97	8.03	7.17	6.37	5.63	4.93	4.27	3.66	3.07	2.62	2.26	1.92	1.59	1.28	.98
70	10.00	9.08	8.24	7.46	6.75	6.08	5.46	4.87	4.32	3.80	3.32	2.86	2.43	2.02	1.62	1.24
80	10.00	9.10	8.28	7.53	6.83	6.18	5.58	5.01	4.47	3.96	3.47	3.00	2.54	2.11	1.70	1.30
90	10.00	9.12	8.32	7.58	6.89	6.26	5.66	5.10	4.58	4.08	3.58	3.09	2.62	2.18	1.75	1.34
100	10.00	9.13	8.34	7.62	6.94	6.31	5.73	5.18	4.66	4.17	3.67	3.17	2.69	2.23	1.79	1.37
200	10.00	9.20	8.47	7.79	7.17	6.59	6.05	5.54	5.06	4.60	4.17	3.76	3.37	3.00	2.64	2.30
300	10.00	9.28	8.62	8.01	7.45	6.92	6.43	5.98	5.54	5.13	4.74	4.37	4.02	3.68	3.36	3.05
400	10.00	9.30	8.66	8.07	7.53	7.02	6.55	6.11	5.69	5.29	4.91	4.55	4.21	3.89	3.58	3.28
500	10.00	9.32	8.69	8.12	7.59	7.10	6.63	6.20	5.79	5.40	5.04	4.69	4.35	4.04	3.73	3.44
600	10.00	9.34	8.74	8.19	7.68	7.21	6.76	6.34	5.95	5.58	5.22	4.89	4.57	4.26	3.97	3.69
700	10.00	9.35	8.76	8.22	7.72	7.25	6.81	6.40	6.01	5.65	5.30	4.97	4.66	4.36	4.07	3.80
800	10.00	9.37	8.80	8.28	7.79	7.34	6.91	6.51	6.14	5.78	5.44	5.12	4.82	4.53	4.25	3.98
900	10.00	9.38	8.82	8.30	7.81	7.37	6.95	6.55	6.18	5.83	5.50	5.18	4.88	4.59	4.31	4.05
1000	10.00	9.39	8.83	8.31	7.84	7.39	6.98	6.59	6.22	5.87	5.54	5.23	4.93	4.64	4.37	4.11

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
100	10	-10.0	---

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 100 MJ/M^3

R

TAU	1.0	3.0	4.0	5.0	7.0	10.0	12.0	15.0	20.0	25.0	30.0	40.0	50.0	60.0	70.0	100.0
1	10.00	-8.58	-9.69	-9.94	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
2	10.00	-7.02	-8.89	-9.61	-9.97	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
3	10.00	-6.22	-8.21	-9.20	-9.89	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
4	10.00	-5.72	-7.70	-8.82	-9.77	-9.98	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
5	10.00	-5.10	-7.26	-8.49	-9.63	-9.96	-9.99	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
6	10.00	-4.49	-6.79	-8.15	-9.48	-9.93	-9.99	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
7	10.00	-4.01	-6.36	-7.81	-9.31	-9.89	-9.98	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
8	10.00	-3.73	-6.02	-7.52	-9.14	-9.85	-9.96	-9.99	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
9	10.00	-3.55	-5.76	-7.26	-8.98	-9.79	-9.94	-9.99	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
10	10.00	-3.40	-5.55	-7.04	-8.81	-9.73	-9.92	-9.98	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
20	10.00	-2.27	-4.32	-5.77	-7.67	-9.09	-9.57	-9.85	-9.98	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
30	10.00	-1.27	-3.27	-4.76	-6.82	-8.51	-9.16	-9.64	-9.93	-9.98	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
40	10.00	-1.18	-2.87	-4.24	-6.23	-8.02	-8.77	-9.39	-9.84	-9.96	-9.99	-10.00	-10.00	-10.00	-10.00	-10.00
50	10.00	-.93	-2.68	-3.97	-5.85	-7.64	-8.43	-9.15	-9.74	-9.92	-9.98	-10.00	-10.00	-10.00	-10.00	-10.00
60	10.00	-.52	-2.55	-3.78	-5.59	-7.35	-8.15	-8.93	-9.62	-9.86	-9.96	-10.00	-10.00	-10.00	-10.00	-10.00
70	10.00	-.34	-2.14	-3.44	-5.31	-7.10	-7.92	-8.74	-9.50	-9.80	-9.93	-9.99	-10.00	-10.00	-10.00	-10.00
80	10.00	-.25	-1.86	-3.15	-5.03	-6.85	-7.69	-8.55	-9.38	-9.74	-9.90	-9.99	-10.00	-10.00	-10.00	-10.00
90	10.00	-.18	-1.65	-2.92	-4.79	-6.63	-7.49	-8.38	-9.27	-9.67	-9.86	-9.98	-10.00	-10.00	-10.00	-10.00
100	10.00	-.12	-1.47	-2.73	-4.59	-6.43	-7.29	-8.21	-9.15	-9.60	-9.82	-9.97	-10.00	-10.00	-10.00	-10.00
200	10.00	1.20	-.71	-2.02	-3.62	-5.30	-6.13	-7.10	-8.22	-8.92	-9.36	-9.79	-9.94	-9.99	-9.99	-10.00
300	10.00	1.65	-.34	-1.39	-2.99	-4.66	-5.49	-6.46	-7.63	-8.41	-8.94	-9.56	-9.83	-9.95	-9.98	-10.00
400	10.00	1.77	-.16	-1.03	-2.58	-4.21	-5.03	-6.00	-7.18	-8.00	-8.59	-9.32	-9.69	-9.88	-9.94	-10.00
500	10.00	1.86	-.02	-.76	-2.28	-3.88	-4.68	-5.64	-6.83	-7.67	-8.29	-9.10	-9.55	-9.80	-9.90	-9.99
600	10.00	2.43	.39	-.70	-2.13	-3.66	-4.44	-5.38	-6.55	-7.40	-8.04	-8.90	-9.41	-9.71	-9.84	-9.99
700	10.00	2.57	.96	-.29	-2.10	-3.55	-4.29	-5.20	-6.34	-7.19	-7.83	-8.72	-9.27	-9.61	-9.78	-9.98
800	10.00	2.78	1.07	-.24	-1.91	-3.38	-4.13	-5.03	-6.17	-7.01	-7.65	-8.57	-9.14	-9.52	-9.71	-9.96
900	10.00	2.86	1.11	-.21	-1.77	-3.24	-3.98	-4.87	-6.00	-6.84	-7.49	-8.42	-9.02	-9.42	-9.65	-9.95
1000	10.00	2.93	1.15	-.18	-1.66	-3.11	-3.84	-4.73	-5.86	-6.70	-7.35	-8.29	-8.91	-9.33	-9.58	-9.93

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
100	10	-10.0	---

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 100 MJ/M^3

TAU	R 1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5
4	30.00	26.83	23.94	21.30	18.84	16.56	14.47	12.51	10.66	8.91	7.27	5.72	4.24	2.83	1.48	.19
5	30.00	26.90	24.07	21.47	19.06	16.82	14.73	12.77	10.91	9.16	7.71	6.49	5.33	4.21	3.15	2.12
6	30.00	26.92	24.12	21.54	19.16	16.95	14.93	13.04	11.26	9.57	8.11	6.83	5.61	4.44	3.33	2.26
7	30.00	27.19	24.64	22.30	20.14	18.13	16.35	14.67	13.09	11.60	10.29	9.13	8.02	6.96	5.94	4.97
8	30.00	27.39	25.02	22.85	20.84	18.97	17.27	15.67	14.16	12.74	11.44	10.25	9.11	8.02	6.98	5.98
9	30.00	27.50	25.22	23.13	21.19	19.39	17.72	16.16	14.69	13.30	12.00	10.79	9.63	8.53	7.47	6.46
10	30.00	27.55	25.32	23.26	21.36	19.59	17.95	16.40	14.95	13.57	12.27	11.05	9.89	8.77	7.71	6.68
20	30.00	27.96	26.11	24.40	22.82	21.35	19.98	18.69	17.48	16.34	15.26	14.24	13.27	12.34	11.46	10.61
30	30.00	28.03	26.23	24.58	23.05	21.62	20.29	19.04	17.87	16.75	15.70	14.71	13.76	12.85	11.98	11.15
40	30.00	28.26	26.68	25.22	23.88	22.62	21.45	20.35	19.32	18.34	17.41	16.54	15.70	14.91	14.14	13.41
50	30.00	28.32	26.79	25.38	24.07	22.86	21.72	20.66	19.65	18.70	17.80	16.94	16.12	15.34	14.59	13.87
60	30.00	28.33	26.81	25.40	24.10	22.90	21.77	20.70	19.70	18.75	17.86	17.00	16.19	15.41	14.66	13.95
70	30.00	28.42	26.97	25.65	24.42	23.27	22.21	21.20	20.26	19.37	18.53	17.73	16.97	16.24	15.55	14.88
80	30.00	28.50	27.13	25.87	24.71	23.62	22.61	21.66	20.76	19.91	19.11	18.35	17.62	16.92	16.26	15.62
90	30.00	28.53	27.19	25.96	24.82	23.76	22.77	21.84	20.96	20.13	19.34	18.59	17.88	17.19	16.54	15.91
100	30.00	28.55	27.22	26.00	24.87	23.81	22.83	21.90	21.03	20.21	19.43	18.68	17.97	17.29	16.65	16.02
200	30.00	28.72	27.55	26.47	25.48	24.55	23.68	22.87	22.10	21.37	20.68	20.03	19.40	18.80	18.23	17.68
300	30.00	28.82	27.75	26.76	25.85	25.00	24.20	23.46	22.75	22.09	21.45	20.85	20.28	19.73	19.21	18.71
400	30.00	28.85	27.81	26.85	25.96	25.13	24.35	23.63	22.94	22.29	21.67	21.09	20.53	19.99	19.48	18.99
500	30.00	28.89	27.88	26.95	26.09	25.29	24.54	23.84	23.17	22.55	21.95	21.39	20.85	20.33	19.84	19.37
600	30.00	28.95	27.99	27.11	26.29	25.54	24.82	24.16	23.53	22.93	22.37	21.83	21.32	20.83	20.36	19.91
700	30.00	28.96	28.02	27.14	26.34	25.59	24.88	24.22	23.60	23.01	22.45	21.92	21.42	20.93	20.47	20.02
800	30.00	28.96	28.02	27.15	26.35	25.60	24.89	24.24	23.62	23.03	22.47	21.94	21.44	20.95	20.49	20.05
900	30.00	28.98	28.04	27.19	26.39	25.65	24.96	24.31	23.70	23.12	22.57	22.04	21.55	21.07	20.61	20.18
1000	30.00	29.02	28.13	27.30	26.54	25.83	25.17	24.55	23.96	23.41	22.88	22.38	21.90	21.44	21.01	20.59

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
100	30	-.01	---

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 100 MJ/M^3

R

TAU	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0
1	30.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
2	30.00	2.31	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
3	30.00	5.61	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
4	30.00	7.27	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
5	30.00	7.71	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
6	30.00	8.11	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
7	30.00	10.29	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
8	30.00	11.44	.58	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
9	30.00	12.00	1.59	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
10	30.00	12.27	2.35	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
20	30.00	15.26	6.92	.76	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
30	30.00	15.70	7.57	2.58	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
40	30.00	17.41	10.21	5.31	1.07	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
50	30.00	17.80	10.68	5.67	2.19	-.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01
60	30.00	17.86	10.76	5.74	2.04	.13	-.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01
70	30.00	18.53	11.98	7.58	4.47	1.54	-.00	-.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01
80	30.00	19.11	12.81	8.43	5.16	2.27	-.00	-.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01
90	30.00	19.34	13.13	8.76	5.41	2.69	.38	-.00	-.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01
100	30.00	19.43	13.25	8.88	5.51	2.93	.94	-.00	-.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01
200	30.00	20.68	15.23	11.37	8.38	5.95	3.89	2.35	1.04	-.00	-.00	-.00	-.00	-.00	-.00	-.00
300	30.00	21.45	16.47	12.95	10.25	8.07	6.25	4.71	3.37	1.98	.62	-.00	-.00	-.00	-.00	-.00
400	30.00	21.67	16.80	13.35	10.67	8.48	6.64	5.04	3.63	2.54	1.65	.83	.09	-.00	-.00	-.00
500	30.00	21.95	17.26	13.95	11.42	9.39	7.70	6.30	5.08	4.04	3.15	2.33	1.26	.19	-.00	-.00
600	30.00	22.37	17.91	14.75	12.30	10.31	8.64	7.20	5.94	4.82	3.81	2.89	1.95	1.07	.24	-.00
700	30.00	22.45	18.04	14.91	12.48	10.50	8.83	7.38	6.10	4.97	3.94	3.00	2.22	1.52	.87	.26
800	30.00	22.47	18.07	14.94	12.52	10.54	8.87	7.42	6.14	5.00	3.96	3.02	2.34	1.76	1.22	.72
900	30.00	22.57	18.23	15.16	12.79	10.88	9.27	7.92	6.73	5.72	4.82	4.00	3.33	2.73	2.16	1.60
1000	30.00	22.88	18.72	15.77	13.50	11.65	10.10	8.77	7.60	6.58	5.66	4.83	4.09	3.41	2.78	2.16

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
100	30	-.01	---

TEMPERATURES IN RADIAL HEAT FLOW

LATENT HEAT DENSITY, 100 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5
1	30.00	24.08	18.96	14.53	10.42	6.60	3.03	-.01	-.14	-.27	-.63	-1.15	-1.65	-2.12	-2.58	-3.02
2	30.00	25.67	21.73	18.10	14.75	11.63	8.85	6.24	3.77	1.44	-.13	-.47	-.80	-1.11	-1.42	-1.70
3	30.00	25.79	21.99	18.54	15.34	12.40	10.31	8.33	6.48	4.72	3.05	1.47	-.01	-.37	-.72	-1.05
4	30.00	26.62	23.57	20.78	18.19	15.79	13.70	11.74	9.88	8.13	6.03	3.72	1.51	-.07	-.29	-.50
5	30.00	26.86	24.00	21.37	18.93	16.67	14.58	12.62	10.77	9.02	7.22	5.42	3.70	2.05	.48	-.15
6	30.00	26.90	24.08	21.48	19.08	16.84	14.75	12.79	10.94	9.19	7.62	6.20	4.85	3.55	2.32	1.13
7	30.00	26.91	24.10	21.50	19.10	16.87	14.78	12.82	10.97	9.22	7.80	6.62	5.51	4.44	3.42	2.43
8	30.00	26.94	24.15	21.59	19.22	17.01	15.02	13.14	11.37	9.70	8.33	7.13	6.10	5.06	4.07	3.11
9	30.00	27.16	24.58	22.21	20.02	17.99	16.17	14.46	12.85	11.32	9.96	8.79	7.65	6.56	5.51	4.51
10	30.00	27.37	24.97	22.78	20.74	18.85	17.14	15.53	14.02	12.58	11.28	10.09	8.96	7.88	6.84	5.84
20	30.00	27.65	25.50	23.53	21.71	20.02	18.45	16.99	15.61	14.30	13.09	11.97	10.90	9.88	8.90	7.97
30	30.00	28.02	26.20	24.54	23.00	21.56	20.22	18.96	17.77	16.65	15.58	14.57	13.61	12.69	11.81	10.96
40	30.00	28.03	26.23	24.58	23.04	21.62	20.28	19.03	17.85	16.73	15.67	14.66	13.70	12.78	11.90	11.06
50	30.00	28.20	26.55	25.04	23.64	22.34	21.13	19.99	18.92	17.90	16.95	16.05	15.19	14.38	13.59	12.84
60	30.00	28.31	26.77	25.35	24.03	22.81	21.67	20.59	19.58	18.62	17.72	16.86	16.04	15.25	14.50	13.78
70	30.00	28.33	26.80	25.40	24.10	22.89	21.76	20.69	19.69	18.74	17.84	16.99	16.17	15.39	14.65	13.93
80	30.00	28.33	26.81	25.41	24.11	22.90	21.77	20.71	19.71	18.76	17.86	17.01	16.20	15.42	14.67	13.96
90	30.00	28.33	26.81	25.41	24.11	22.90	21.77	20.71	19.71	18.77	17.87	17.02	16.20	15.42	14.68	13.97
100	30.00	28.40	26.95	25.61	24.37	23.22	22.14	21.13	20.18	19.28	18.43	17.62	16.85	16.12	15.41	14.74
200	30.00	28.59	27.30	26.12	25.02	24.00	23.04	22.15	21.30	20.50	19.75	19.03	18.35	17.69	17.07	16.47
300	30.00	28.72	27.55	26.48	25.49	24.56	23.70	22.88	22.12	21.39	20.70	20.05	19.43	18.83	18.26	17.71
400	30.00	28.75	27.60	26.55	25.58	24.67	23.83	23.03	22.28	21.57	20.90	20.26	19.65	19.07	18.51	17.98
500	30.00	28.85	27.80	26.83	25.93	25.10	24.32	23.59	22.90	22.24	21.62	21.04	20.47	19.94	19.42	18.93
600	30.00	28.86	27.81	26.85	25.96	25.13	24.36	23.63	22.95	22.30	21.68	21.10	20.54	20.01	19.49	19.00
700	30.00	28.86	27.81	26.85	25.96	25.14	24.36	23.63	22.95	22.30	21.69	21.10	20.54	20.01	19.50	19.01
800	30.00	28.88	27.87	26.93	26.06	25.25	24.50	23.79	23.12	22.49	21.89	21.32	20.77	20.25	19.76	19.28
900	30.00	28.94	27.98	27.09	26.27	25.50	24.79	24.12	23.48	22.88	22.31	21.77	21.26	20.77	20.29	19.84
1000	30.00	28.96	28.01	27.14	26.33	25.58	24.88	24.21	23.59	23.00	22.44	21.91	21.40	20.92	20.46	20.01

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
100	30	-5.0	---

TEMPERATURES IN RADIAL HEAT FLOW

LATENT HEAT DENSITY, 100 MJ/M^3

R

TAU	1.0	3.0	4.0	5.0	7.0	10.0	12.0	15.0	20.0	25.0	30.0	40.0	50.0	60.0	70.0	100.0
1	30.00	-3.97	-4.77	-4.95	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
2	30.00	-2.81	-4.17	-4.71	-4.98	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
3	30.00	-2.26	-3.72	-4.42	-4.92	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
4	30.00	-1.44	-3.10	-4.08	-4.83	-4.99	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
5	30.00	-1.13	-2.74	-3.76	-4.71	-4.97	-4.99	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
6	30.00	-.90	-2.51	-3.53	-4.58	-4.95	-4.99	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
7	30.00	-.65	-2.35	-3.34	-4.46	-4.92	-4.98	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
8	30.00	-.37	-2.15	-3.19	-4.34	-4.88	-4.97	-4.99	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
9	30.00	-.24	-1.70	-2.88	-4.22	-4.84	-4.96	-4.99	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
10	30.00	-.11	-1.42	-2.60	-4.08	-4.80	-4.94	-4.99	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
20	30.00	4.28	-.27	-1.49	-3.16	-4.28	-4.66	-4.88	-4.98	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
30	30.00	7.21	.94	-.81	-2.36	-3.76	-4.31	-4.71	-4.94	-4.99	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
40	30.00	7.29	2.53	-.36	-2.07	-3.42	-4.00	-4.51	-4.87	-4.96	-4.99	-5.00	-5.00	-5.00	-5.00	-5.00
50	30.00	9.62	4.82	-.08	-1.35	-3.03	-3.72	-4.32	-4.79	-4.93	-4.98	-5.00	-5.00	-5.00	-5.00	-5.00
60	30.00	10.59	5.59	.99	-1.12	-2.69	-3.42	-4.11	-4.69	-4.89	-4.96	-5.00	-5.00	-5.00	-5.00	-5.00
70	30.00	10.74	5.71	1.92	-1.00	-2.50	-3.20	-3.92	-4.58	-4.84	-4.94	-4.99	-5.00	-5.00	-5.00	-5.00
80	30.00	10.77	5.73	2.43	-.90	-2.36	-3.04	-3.77	-4.48	-4.78	-4.91	-4.99	-5.00	-5.00	-5.00	-5.00
90	30.00	10.79	5.84	2.78	-.78	-2.26	-2.92	-3.64	-4.38	-4.73	-4.88	-4.98	-5.00	-5.00	-5.00	-5.00
100	30.00	11.79	7.29	4.12	-.42	-1.84	-2.70	-3.50	-4.29	-4.67	-4.85	-4.97	-5.00	-5.00	-5.00	-5.00
200	30.00	13.81	9.69	6.62	2.07	-.55	-1.52	-2.48	-3.48	-4.08	-4.45	-4.82	-4.95	-4.99	-5.00	-5.00
300	30.00	15.27	11.41	8.42	3.92	-.20	-.94	-1.79	-2.84	-3.56	-4.05	-4.61	-4.85	-4.96	-4.98	-5.00
400	30.00	15.60	11.88	9.05	4.94	.70	-.25	-1.30	-2.49	-3.23	-3.75	-4.40	-4.73	-4.90	-4.95	-5.00
500	30.00	16.73	13.26	10.58	6.55	2.04	-.18	-.89	-1.98	-2.81	-3.41	-4.18	-4.59	-4.82	-4.91	-4.99
600	30.00	16.82	13.37	10.69	6.65	2.42	.35	-.75	-1.80	-2.58	-3.16	-3.99	-4.46	-4.74	-4.86	-4.99
700	30.00	16.82	13.37	10.69	6.66	2.58	.97	-.61	-1.70	-2.44	-3.01	-3.82	-4.33	-4.65	-4.80	-4.98
800	30.00	17.15	13.81	11.24	7.44	3.56	1.54	-.11	-1.30	-2.20	-2.84	-3.69	-4.21	-4.56	-4.74	-4.97
900	30.00	17.82	14.65	12.19	8.52	4.72	2.82	-.17	-1.00	-1.87	-2.56	-3.51	-4.09	-4.47	-4.68	-4.95
1000	30.00	18.02	14.89	12.46	8.81	4.95	2.98	-.03	-.91	-1.73	-2.39	-3.35	-3.97	-4.38	-4.61	-4.94

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU$_0$
100	30	-5.0	---

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 100 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5
1	30.00	22.97	17.52	13.42	9.63	6.10	2.80	-.15	-1.60	-2.97	-3.88	-4.47	-5.03	-5.56	-6.08	-6.57
2	30.00	25.60	21.61	17.95	14.56	11.36	7.33	3.56	-.00	-.60	-1.17	-1.70	-2.22	-2.71	-3.18	-3.63
3	30.00	25.70	21.77	18.15	14.81	11.72	9.33	7.09	4.97	2.97	1.07	-.29	-.98	-1.64	-2.27	-2.87
4	30.00	25.97	22.33	19.03	15.97	13.14	10.92	8.83	6.86	5.00	3.24	1.56	-.02	-.64	-1.23	-1.81
5	30.00	26.54	23.40	20.53	17.88	15.42	13.28	11.27	9.37	7.58	5.28	2.65	.14	-.39	-.80	-1.18
6	30.00	26.83	23.95	21.30	18.86	16.58	14.49	12.52	10.67	8.92	6.82	4.49	2.27	.15	-.35	-.71
7	30.00	26.90	24.07	21.47	19.06	16.82	14.73	12.77	10.92	9.17	7.37	5.56	3.83	2.18	.60	-.24
8	30.00	26.91	24.09	21.50	19.10	16.87	14.78	12.81	10.96	9.21	7.61	6.13	4.73	3.38	2.09	.85
9	30.00	26.91	24.10	21.51	19.11	16.87	14.79	12.82	10.97	9.22	7.75	6.49	5.30	4.15	3.05	2.00
10	30.00	26.91	24.10	21.51	19.11	16.88	14.79	12.82	10.97	9.22	7.85	6.75	5.70	4.70	3.74	2.82
20	30.00	27.59	25.40	23.38	21.50	19.76	18.13	16.60	15.16	13.80	12.50	11.27	10.10	8.98	7.90	6.87
30	30.00	27.76	25.72	23.84	22.11	20.49	19.00	17.59	16.27	15.01	13.84	12.75	11.70	10.70	9.74	8.82
40	30.00	28.01	26.20	24.53	22.98	21.54	20.20	18.94	17.75	16.62	15.56	14.55	13.58	12.66	11.78	10.93
50	30.00	28.03	26.23	24.58	23.04	21.62	20.28	19.03	17.85	16.73	15.67	14.66	13.70	12.78	11.90	11.06
60	30.00	28.03	26.23	24.58	23.05	21.62	20.29	19.03	17.85	16.73	15.67	14.67	13.70	12.79	11.91	11.06
70	30.00	28.15	26.45	24.90	23.46	22.12	20.87	19.69	18.59	17.54	16.55	15.62	14.73	13.88	13.06	12.28
80	30.00	28.25	26.64	25.17	23.81	22.54	21.35	20.24	19.19	18.20	17.27	16.38	15.53	14.72	13.95	13.21
90	30.00	28.32	26.78	25.36	24.05	22.84	21.70	20.63	19.62	18.66	17.76	16.90	16.08	15.30	14.55	13.83
100	30.00	28.33	26.80	25.40	24.10	22.89	21.76	20.70	19.70	18.75	17.85	17.00	16.18	15.40	14.66	13.94
200	30.00	28.54	27.21	25.99	24.85	23.80	22.81	21.89	21.01	20.19	19.40	18.66	17.95	17.27	16.62	16.00
300	30.00	28.55	27.23	26.02	24.89	23.85	22.87	21.95	21.08	20.26	19.48	18.74	18.03	17.36	16.71	16.09
400	30.00	28.68	27.48	26.37	25.35	24.39	23.50	22.66	21.87	21.13	20.42	19.74	19.10	18.49	17.90	17.34
500	30.00	28.72	27.56	26.48	25.49	24.57	23.70	22.89	22.12	21.40	20.71	20.06	19.43	18.84	18.27	17.72
600	30.00	28.72	27.56	26.48	25.49	24.57	23.70	22.89	22.12	21.40	20.71	20.06	19.43	18.84	18.27	17.72
700	30.00	28.75	27.62	26.57	25.60	24.70	23.86	23.07	22.32	21.61	20.94	20.31	19.70	19.12	18.56	18.03
800	30.00	28.81	27.72	26.72	25.79	24.92	24.12	23.36	22.64	21.97	21.32	20.71	20.13	19.57	19.04	18.53
900	30.00	28.84	27.78	26.81	25.91	25.07	24.28	23.55	22.85	22.19	21.57	20.98	20.41	19.87	19.36	18.86
1000	30.00	28.86	27.81	26.85	25.96	25.13	24.36	23.63	22.94	22.29	21.68	21.09	20.54	20.00	19.49	19.00

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
100	30	-10.0	---

TEMPERATURES IN RADIAL HEAT FLOW
****

LATENT HEAT DENSITY, 100 MJ/M^3

R

TAU	1.0	3.0	4.0	5.0	7.0	10.0	12.0	15.0	20.0	25.0	30.0	40.0	50.0	60.0	70.0	100.0
1	30.00	-8.13	-9.57	-9.91	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
2	30.00	-5.86	-8.49	-9.48	-9.96	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
3	30.00	-4.88	-7.55	-8.91	-9.85	-9.99	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
4	30.00	-4.04	-6.88	-8.40	-9.69	-9.98	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
5	30.00	-2.90	-5.98	-7.87	-9.49	-9.95	-9.99	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
6	30.00	-2.34	-5.30	-7.31	-9.27	-9.91	-9.98	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
7	30.00	-1.98	-4.87	-6.87	-9.02	-9.85	-9.97	-9.99	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
8	30.00	-1.68	-4.58	-6.54	-8.78	-9.79	-9.95	-9.99	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
9	30.00	-1.36	-4.36	-6.27	-8.57	-9.71	-9.92	-9.98	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
10	30.00	-.93	-4.18	-6.05	-8.36	-9.63	-9.89	-9.97	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
20	30.00	2.29	-1.79	-3.78	-6.55	-8.69	-9.39	-9.79	-9.97	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
30	30.00	4.76	-.48	-2.51	-5.56	-7.91	-8.81	-9.48	-9.90	-9.98	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
40	30.00	7.19	-.13	-1.66	-4.40	-7.11	-8.23	-9.13	-9.78	-9.94	-9.98	-10.00	-10.00	-10.00	-10.00	-10.00
50	30.00	7.29	1.62	-1.21	-3.95	-6.55	-7.71	-8.77	-9.62	-9.88	-9.97	-10.00	-10.00	-10.00	-10.00	-10.00
60	30.00	7.29	2.56	-.61	-3.68	-6.16	-7.32	-8.45	-9.45	-9.80	-9.94	-9.99	-10.00	-10.00	-10.00	-10.00
70	30.00	8.88	3.51	-.22	-2.99	-5.78	-6.98	-8.17	-9.28	-9.72	-9.90	-9.99	-10.00	-10.00	-10.00	-10.00
80	30.00	9.96	5.03	-.20	-2.27	-5.22	-6.57	-7.87	-9.10	-9.62	-9.85	-9.98	-10.00	-10.00	-10.00	-10.00
90	30.00	10.64	5.63	.22	-2.01	-4.81	-6.18	-7.57	-8.92	-9.52	-9.80	-9.97	-10.00	-10.00	-10.00	-10.00
100	30.00	10.75	5.72	1.20	-1.86	-4.56	-5.89	-7.30	-8.74	-9.42	-9.74	-9.95	-9.99	-10.00	-10.00	-10.00
200	30.00	13.22	8.85	5.49	-.39	-2.51	-3.89	-5.49	-7.30	-8.39	-9.05	-9.69	-9.91	-9.98	-9.99	-10.00
300	30.00	13.32	8.96	5.57	1.53	-2.10	-3.27	-4.67	-6.39	-7.57	-8.39	-9.33	-9.74	-9.92	-9.96	-10.00
400	30.00	14.83	10.89	7.88	3.50	-1.02	-1.95	-3.58	-5.58	-6.92	-7.84	-8.97	-9.53	-9.82	-9.91	-10.00
500	30.00	15.28	11.42	8.43	3.92	-.58	-1.66	-3.13	-4.99	-6.33	-7.32	-8.61	-9.31	-9.69	-9.84	-9.99
600	30.00	15.28	11.42	8.43	3.92	.07	-1.50	-2.91	-4.67	-5.96	-6.95	-8.29	-9.08	-9.55	-9.75	-9.98
700	30.00	15.66	11.93	9.06	4.82	.68	-1.02	-2.56	-4.39	-5.68	-6.66	-8.03	-8.87	-9.40	-9.66	-9.97
800	30.00	16.25	12.66	9.89	5.74	.82	-.30	-1.84	-3.84	-5.26	-6.32	-7.77	-8.67	-9.25	-9.56	-9.95
900	30.00	16.65	13.16	10.47	6.45	1.60	-.51	-1.56	-3.40	-4.85	-5.96	-7.50	-8.47	-9.11	-9.45	-9.92
1000	30.00	16.81	13.36	10.68	6.65	2.07	-.29	-1.42	-3.19	-4.59	-5.69	-7.26	-8.27	-8.96	-9.35	-9.89

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
100	30	-10.0	---

APPENDIX B. TABLES OF HEAT FLOW VERSUS TIME FOR A SUSTAINED SOURCE

B

These tables present normalized values ω (1,1) of the heat flow from a source of radius one metre into a medium of conductivity one $Wm^{-1}\ K^{-1}$ for the cases given in Appendix A. The dimensionless time τ is calculated, as in Appendix A, from the diffusivity α_A of the medium in its original, or undisturbed state, A. For a particular application, tabulated values must be multiplied by the conductivity ($Wm^{-1}K^{-1}$) of the medium immediately adjacent to the source and divided by the radius (m), i.e.

$$\omega(r_o,k_A) = \omega(1,1) \times \frac{k_A}{r_o} \quad (Wm^{-2})$$

if the medium in contact with the source at that time is in its original state, or

$$\omega(r_o,k_B) = \omega(1,1) \times \frac{k_B}{r_o} \quad (Wm^{-2})$$

if the medium adjacent to the source has undergone a change of phase. The phase status of the medium in contact with the source is indicated beside each entry in the tables as "A" (undisturbed, original state) or "B" (changed phase). The notation ".AAAE+aa" is interpreted to mean ".AAA x 10^{+aa}", and a "*" replaces any value smaller than $10^{-10}\ Wm^{-2}$.

Index blocks along the lower edge of each table identify the parametric values used: latent heat density (MJ/m^3), source and initial temperatures (^oC), and duration of source τ_o.

HEAT FLOW IN RADIAL SYMMETRY
****

LATENT HEAT DENSITY, 10 MJ/M^3

TAU	HEAT FLOW
.05	.980E+01 (B)
.06	.672E+01 (B)
.07	.595E+01 (B)
.08	.590E+01 (B)
.09	.590E+01 (B)
.10	.589E+01 (B)
.20	.422E+01 (B)
.30	.334E+01 (B)
.40	.328E+01 (B)
.50	.274E+01 (B)
.60	.268E+01 (B)
.70	.266E+01 (B)
.80	.230E+01 (B)
.90	.227E+01 (B)
1.00	.227E+01 (B)

TAU	HEAT FLOW
1.00	.249E+01 (B)
2.00	.151E+01 (B)
3.00	.151E+01 (B)
4.00	.151E+01 (B)
5.00	.115E+01 (B)
6.00	.108E+01 (B)
7.00	.108E+01 (B)
8.00	.108E+01 (B)
9.00	.108E+01 (B)
10.00	.108E+01 (B)
20.00	.841E+00 (B)
30.00	.717E+00 (B)
40.00	.689E+00 (B)
50.00	.689E+00 (B)
60.00	.687E+00 (B)
70.00	.587E+00 (B)
80.00	.584E+00 (B)
90.00	.584E+00 (B)
100.00	.584E+00 (B)
200.00	.507E+00 (B)
300.00	.448E+00 (B)
400.00	.447E+00 (B)
500.00	.433E+00 (B)
600.00	.400E+00 (B)
700.00	.400E+00 (B)
800.00	.400E+00 (B)
900.00	.400E+00 (B)
1000.00	.370E+00 (B)
2000.00	.332E+00 (B)
3000.00	.330E+00 (B)

TAU	HEAT FLOW
.05	.408E+02 (B)
.06	.368E+02 (B)
.07	.348E+02 (B)
.08	.332E+02 (B)
.09	.311E+02 (B)
.10	.296E+02 (B)
.20	.224E+02 (B)
.30	.191E+02 (B)
.40	.172E+02 (B)
.50	.159E+02 (B)
.60	.149E+02 (B)
.70	.141E+02 (B)
.80	.135E+02 (B)
.90	.129E+02 (B)
1.00	.125E+02 (B)
2.00	.101E+02 (B)
3.00	.895E+01 (B)
4.00	.830E+01 (B)

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
10	1	-.01	---

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
10	1	-.01	---

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
10	10	-.01	---

HEAT FLOW IN RADIAL SYMMETRY

LATENT HEAT DENSITY, 10 MJ/M^3

TAU	HEAT FLOW	TAU	HEAT FLOW	TAU	HEAT FLOW
1.00	.124E+02 (B)	1.00	.160E+02 (B)	1.00	.223E+02 (B)
2.00	.103E+02 (B)	2.00	.139E+02 (B)	2.00	.168E+02 (B)
3.00	.882E+01 (B)	3.00	.115E+02 (B)	3.00	.151E+02 (B)
4.00	.843E+01 (B)	4.00	.108E+02 (B)	4.00	.151E+02 (B)
5.00	.775E+01 (B)	5.00	.108E+02 (B)	5.00	.134E+02 (B)
6.00	.730E+01 (B)	6.00	.101E+02 (B)	6.00	.126E+02 (B)
7.00	.708E+01 (B)	7.00	.942E+01 (B)	7.00	.121E+02 (B)
8.00	.698E+01 (B)	8.00	.899E+01 (B)	8.00	.116E+02 (B)
9.00	.682E+01 (B)	9.00	.867E+01 (B)	9.00	.113E+02 (B)
10.00	.654E+01 (B)	10.00	.848E+01 (B)	10.00	.111E+02 (B)
20.00	.560E+01 (B)	20.00	.733E+01 (B)	20.00	.959E+01 (B)
30.00	.513E+01 (B)	30.00	.689E+01 (B)	30.00	.879E+01 (B)
40.00	.485E+01 (B)	40.00	.653E+01 (B)	40.00	.841E+01 (B)
50.00	.460E+01 (B)	50.00	.611E+01 (B)	50.00	.826E+01 (B)
60.00	.451E+01 (B)	60.00	.587E+01 (B)	60.00	.778E+01 (B)
70.00	.441E+01 (B)	70.00	.584E+01 (B)	70.00	.755E+01 (B)
80.00	.424E+01 (B)	80.00	.584E+01 (B)	80.00	.737E+01 (B)
90.00	.413E+01 (B)	90.00	.570E+01 (B)	90.00	.723E+01 (B)
100.00	.408E+01 (B)	100.00	.548E+01 (B)	100.00	.711E+01 (B)
200.00	.365E+01 (B)	200.00	.504E+01 (B)	200.00	.639E+01 (B)
300.00	.341E+01 (B)	300.00	.454E+01 (B)	300.00	.602E+01 (B)
400.00	.333E+01 (B)	400.00	.447E+01 (B)	400.00	.584E+01 (B)
500.00	.318E+01 (B)	500.00	.429E+01 (B)	500.00	.563E+01 (B)
600.00	.309E+01 (B)	600.00	.414E+01 (B)	600.00	.549E+01 (B)
700.00	.305E+01 (B)	700.00	.404E+01 (B)	700.00	.538E+01 (B)
800.00	.303E+01 (B)	800.00	.400E+01 (B)	800.00	.528E+01 (B)
900.00	.295E+01 (B)	900.00	.400E+01 (B)	900.00	.521E+01 (B)
1000.00	.289E+01 (B)	1000.00	.400E+01 (B)	1000.00	.514E+01 (B)
2000.00	.265E+01 (B)				
3000.00	.254E+01 (B)				

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
10	10	-.01	---
10	10	-5.0	---
10	10	-10.0	---

HEAT FLOW IN RADIAL SYMMETRY
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LATENT HEAT DENSITY, 10 MJ/M^3

TAU	HEAT FLOW
.05	.106E+03 (B)
.06	.971E+02 (B)
.07	.908E+02 (B)
.08	.861E+02 (B)
.09	.817E+02 (B)
.10	.782E+02 (B)
.20	.591E+02 (B)
.30	.507E+02 (B)
.40	.457E+02 (B)
.50	.421E+02 (B)
.60	.396E+02 (B)
.70	.375E+02 (B)
.80	.359E+02 (B)
.90	.346E+02 (B)
1.00	.334E+02 (B)
2.00	.270E+02 (B)
3.00	.248E+02 (B)
4.00	.242E+02 (B)

TAU	HEAT FLOW
1.00	.338E+02 (B)
2.00	.271E+02 (B)
3.00	.240E+02 (B)
4.00	.223E+02 (B)
5.00	.211E+02 (B)
6.00	.200E+02 (B)
7.00	.192E+02 (B)
8.00	.187E+02 (B)
9.00	.183E+02 (B)
10.00	.178E+02 (B)
20.00	.153E+02 (B)
30.00	.140E+02 (B)
40.00	.133E+02 (B)
50.00	.127E+02 (B)
60.00	.124E+02 (B)
70.00	.121E+02 (B)
80.00	.117E+02 (B)
90.00	.115E+02 (B)
100.00	.113E+02 (B)
200.00	.102E+02 (B)
300.00	.953E+01 (B)
400.00	.921E+01 (B)
500.00	.889E+01 (B)
600.00	.868E+01 (B)
700.00	.854E+01 (B)
800.00	.838E+01 (B)
900.00	.823E+01 (B)
1000.00	.812E+01 (B)
2000.00	.750E+01 (B)
3000.00	.714E+01 (B)

TAU	HEAT FLOW
1.00	.377E+02 (B)
2.00	.310E+02 (B)
3.00	.268E+02 (B)
4.00	.254E+02 (B)
5.00	.239E+02 (B)
6.00	.225E+02 (B)
7.00	.215E+02 (B)
8.00	.211E+02 (B)
9.00	.208E+02 (B)
10.00	.202E+02 (B)
20.00	.174E+02 (B)
30.00	.157E+02 (B)
40.00	.152E+02 (B)
50.00	.143E+02 (B)
60.00	.138E+02 (B)
70.00	.136E+02 (B)
80.00	.134E+02 (B)
90.00	.130E+02 (B)
100.00	.127E+02 (B)
200.00	.114E+02 (B)
300.00	.109E+02 (B)
400.00	.103E+02 (B)
500.00	.999E+01 (B)
600.00	.989E+01 (B)
700.00	.960E+01 (B)
800.00	.937E+01 (B)
900.00	.922E+01 (B)
1000.00	.916E+01 (B)

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
10	30	-.01	---

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
10	30	-.01	---

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
10	30	-5.0	---

HEAT FLOW IN RADIAL SYMMETRY
****

LATENT HEAT DENSITY, 10 MJ/M^3

TAU	HEAT FLOW	TAU	HEAT FLOW	TAU	HEAT FLOW
1.00	.437E+02 (B)				
2.00	.338E+02 (B)				
3.00	.311E+02 (B)				
4.00	.282E+02 (B)				
5.00	.263E+02 (B)				
6.00	.254E+02 (B)				
7.00	.250E+02 (B)				
8.00	.239E+02 (B)				
9.00	.230E+02 (B)				
10.00	.224E+02 (B)				
20.00	.193E+02 (B)				
30.00	.177E+02 (B)				
40.00	.171E+02 (B)				
50.00	.161E+02 (B)				
60.00	.155E+02 (B)				
70.00	.152E+02 (B)				
80.00	.151E+02 (B)				
90.00	.147E+02 (B)				
100.00	.143E+02 (B)				
200.00	.129E+02 (B)				
300.00	.121E+02 (B)				
400.00	.117E+02 (B)				
500.00	.112E+02 (B)				
600.00	.110E+02 (B)				
700.00	.109E+02 (B)				
800.00	.107E+02 (B)				
900.00	.105E+02 (B)				
1000.00	.103E+02 (B)				

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o	LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o	LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
10	30	-10.0	---								

HEAT FLOW IN RADIAL SYMMETRY
****

LATENT HEAT DENSITY, 100 MJ/M^3

TAU	HEAT FLOW
.05	.290E+02 (B)
.06	.290E+02 (B)
.07	.290E+02 (B)
.08	.290E+02 (B)
.09	.290E+02 (B)
.10	.290F+02 (B)
.20	.982E+01 (B)
.30	.982E+01 (B)
.40	.982E+01 (B)
.50	.982E+01 (B)
.60	.982E+01 (B)
.70	.591E+01 (B)
.80	.591E+01 (B)
.90	.591E+01 (B)
1.00	.591E+01 (B)
2.00	.421E+01 (B)
3.00	.421E+01 (B)
4.00	.329E+01 (B)
5.00	.329E+01 (B)
6.00	.268E+01 (B)
7.00	.268E+01 (B)
8.00	.268E+01 (B)
9.00	.228E+01 (B)
10.00	.228E+01 (B)

TAU	HEAT FLOW
10.00	.250E+01 (B)
20.00	.151E+01 (B)
30.00	.151E+01 (B)
40.00	.151E+01 (B)
50.00	.151E+01 (B)
60.00	.108E+01 (B)
70.00	.108E+01 (B)
80.00	.108E+01 (B)
90.00	.108E+01 (B)
100.00	.108E+01 (B)
200.00	.843E+00 (B)
300.00	.843E+00 (B)
400.00	.690E+00 (B)
500.00	.690E+00 (B)
600.00	.690E+00 (B)
700.00	.690E+00 (B)
800.00	.585E+00 (B)
900.00	.585E+00 (B)
1000.00	.585E+00 (B)

TAU	HEAT FLOW
.05	.982E+02 (B)
.06	.982E+02 (B)
.07	.982E+02 (B)
.08	.780E+02 (B)
.09	.649E+02 (B)
.10	.607E+02 (B)
.20	.484E+02 (B)
.30	.421E+02 (B)
.40	.353E+02 (B)
.50	.329E+02 (B)
.60	.327E+02 (B)
.70	.278E+02 (B)
.80	.270E+02 (B)
.90	.268E+02 (B)
1.00	.254E+02 (B)
2.00	.197E+02 (B)
3.00	.167E+02 (B)
4.00	.152E+02 (B)

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
100	1	-.01	---

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
100	1	-.01	---

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
100	10	-.01	---

HEAT FLOW IN RADIAL SYMMETRY
****

LATENT HEAT DENSITY, 100 MJ/M^3

TAU	HEAT FLOW	TAU	HEAT FLOW	TAU	HEAT FLOW
1.00	.250E+02 (B)	1.00	.250E+02 (B)	1.00	.296E+02 (B)
2.00	.199E+02 (B)	2.00	.250E+02 (B)	2.00	.250E+02 (B)
3.00	.151E+02 (B)	3.00	.193E+02 (B)	3.00	.250E+02 (B)
4.00	.151E+02 (B)	4.00	.152E+02 (B)	4.00	.242E+02 (B)
5.00	.151E+02 (B)	5.00	.151E+02 (B)	5.00	.183E+02 (B)
6.00	.149E+02 (B)	6.00	.151E+02 (B)	6.00	.171E+02 (B)
7.00	.117E+02 (B)	7.00	.151E+02 (B)	7.00	.157E+02 (B)
8.00	.110E+02 (B)	8.00	.151E+02 (B)	8.00	.151E+02 (B)
9.00	.108E+02 (B)	9.00	.151E+02 (B)	9.00	.151E+02 (B)
10.00	.108E+02 (B)	10.00	.141E+02 (B)	10.00	.151E+02 (B)
20.00	.855E+01 (B)	20.00	.108E+02 (B)	20.00	.127E+02 (B)
30.00	.843E+01 (B)	30.00	.978E+01 (B)	30.00	.115E+02 (B)
40.00	.750E+01 (B)	40.00	.843E+01 (B)	40.00	.108E+02 (B)
50.00	.692E+01 (B)	50.00	.843E+01 (B)	50.00	.108E+02 (B)
60.00	.690E+01 (B)	60.00	.843E+01 (B)	60.00	.108E+02 (B)
70.00	.690E+01 (B)	70.00	.843E+01 (B)	70.00	.968E+01 (B)
80.00	.688E+01 (B)	80.00	.754E+01 (B)	80.00	.944E+01 (B)
90.00	.607E+01 (B)	90.00	.698E+01 (B)	90.00	.925E+01 (B)
100.00	.589E+01 (B)	100.00	.690E+01 (B)	100.00	.911E+01 (B)
200.00	.510E+01 (B)	200.00	.619E+01 (B)	200.00	.843E+01 (B)
300.00	.506E+01 (B)	300.00	.585E+01 (B)	300.00	.760E+01 (B)
400.00	.450E+01 (B)	400.00	.585E+01 (B)	400.00	.736E+01 (B)
500.00	.448E+01 (B)	500.00	.522E+01 (B)	500.00	.718E+01 (B)
600.00	.448E+01 (B)	600.00	.506E+01 (B)	600.00	.690E+01 (B)
700.00	.415E+01 (B)	700.00	.506E+01 (B)	700.00	.679E+01 (B)
800.00	.401E+01 (B)	800.00	.506E+01 (B)	800.00	.659E+01 (B)
900.00	.401E+01 (B)	900.00	.506E+01 (B)	900.00	.651E+01 (B)
1000.00	.401E+01 (B)	1000.00	.482E+01 (B)	1000.00	.645E+01 (B)

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o	LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o	LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
100	10	-.01	---	100	10	-5.0	---	100	10	-10.0	---

HEAT FLOW IN RADIAL SYMMETRY
****

LATENT HEAT DENSITY, 100 MJ/M^3

TAU	HEAT FLOW	TAU	HEAT FLOW	TAU	HEAT FLOW
.05	.190E+03 (B)	1.00	.542E+02 (B)	1.00	.639E+02 (B)
.06	.181E+03 (B)	2.00	.454E+02 (B)	2.00	.456E+02 (B)
.07	.178E+03 (B)	3.00	.375E+02 (B)	3.00	.446E+02 (B)
.08	.167E+03 (B)	4.00	.333E+02 (B)	4.00	.357E+02 (B)
.09	.151E+03 (B)	5.00	.327E+02 (B)	5.00	.331E+02 (B)
.10	.140E+03 (B)	6.00	.325E+02 (B)	6.00	.325E+02 (B)
.20	.104E+03 (B)	7.00	.296E+02 (B)	7.00	.325E+02 (B)
.30	.887E+02 (B)	8.00	.274E+02 (B)	8.00	.323E+02 (B)
.40	.808E+02 (B)	9.00	.262E+02 (B)	9.00	.298E+02 (B)
.50	.722E+02 (B)	10.00	.258E+02 (B)	10.00	.276E+02 (B)
.60	.685E+02 (B)	20.00	.214E+02 (B)	20.00	.248E+02 (B)
.70	.633E+02 (B)	30.00	.208E+02 (B)	30.00	.208E+02 (B)
.80	.609E+02 (B)	40.00	.182E+02 (B)	40.00	.208E+02 (B)
.90	.583E+02 (B)	50.00	.176E+02 (B)	50.00	.190E+02 (B)
1.00	.554E+02 (B)	60.00	.176E+02 (B)	60.00	.178E+02 (B)
2.00	.435E+02 (B)	70.00	.166E+02 (B)	70.00	.176E+02 (B)
3.00	.381E+02 (B)	80.00	.158E+02 (B)	80.00	.175E+02 (B)
4.00	.347E+02 (B)	90.00	.154E+02 (B)	90.00	.175E+02 (B)
		100.00	.153E+02 (B)	100.00	.168E+02 (B)
		200.00	.135E+02 (B)	200.00	.148E+02 (B)
		300.00	.124E+02 (B)	300.00	.134E+02 (B)
		400.00	.120E+02 (B)	400.00	.132E+02 (B)
		500.00	.116E+02 (B)	500.00	.121E+02 (B)
		600.00	.110E+02 (B)	600.00	.120E+02 (B)
		700.00	.109E+02 (B)	700.00	.120E+02 (B)
		800.00	.109E+02 (B)	800.00	.117E+02 (B)
		900.00	.107E+02 (B)	900.00	.111E+02 (B)
		1000.00	.103E+02 (B)	1000.00	.109E+02 (B)

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
100	30	-.01	---

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
100	30	-.01	---

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
100	30	-5.0	---

HEAT FLOW IN RADIAL SYMMETRY
****

LATENT HEAT DENSITY, 100 MJ/M^3

TAU	HEAT FLOW	TAU	HEAT FLOW	TAU	HEAT FLOW
1.00	.748E+02 (B)				
2.00	.464E+02 (B)				
3.00	.452E+02 (B)				
4.00	.425E+02 (B)				
5.00	.365E+02 (B)				
6.00	.333E+02 (B)				
7.00	.327E+02 (B)				
8.00	.325E+02 (B)				
9.00	.325E+02 (B)				
10.00	.325E+02 (B)				
20.00	.252E+02 (B)				
30.00	.236E+02 (B)				
40.00	.210E+02 (B)				
50.00	.208E+02 (B)				
60.00	.208E+02 (B)				
70.00	.195E+02 (B)				
80.00	.184E+02 (B)				
90.00	.177E+02 (B)				
100.00	.176E+02 (B)				
200.00	.153E+02 (B)				
300.00	.152E+02 (B)				
400.00	.139E+02 (B)				
500.00	.134E+02 (B)				
600.00	.134E+02 (B)				
700.00	.131E+02 (B)				
800.00	.125E+02 (B)				
900.00	.122E+02 (B)				
1000.00	.120E+02 (B)				

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o	LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o	LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
100	30	-10.0	---								

APPENDIX C. TABLES OF TEMPERATURE VERSUS TIME FOR A SOURCE OF FINITE DURATION

Consider a homogeneous medium at constant initial temperature, bounded internally by a cylinder of radius r_o held at constant temperature for time $0 < t \leq t_o$. For time $t > t_o$, the source cylinder and the medium relax to initial conditions. The thermal conductivity, specific heat and density of the medium are k_A, c_A and ρ_A, respectively, where the subscript A denotes the phase of the medium in its undisturbed state.

For a system not undergoing a phase change, the initial temperature is 0^oC. For a system that will experience a phase change, cases are presented for initial temperatures of -0.01^o, -5°, and -10^oC, and the phase change is assumed to occur at 0^oC. In all cases, the medium is initially in state A, compatible with the initial temperature, and the corresponding values of k_A, c_A and ρ_A are used to calculate dimensionless time τ. The latent heat density, L, is the heat required per cubic metre of medium to complete the change of state. It is defined from the latent heat Λ (J kg^{-1}) and density ρ_w (kg m^{-3}) of pore saturant which occupies a fraction ϕ of the total volume.

Parameters:

$$\alpha_A = \frac{k_A}{c_A \rho_A} \qquad (m^2 s)$$

$$\tau = \frac{\alpha_A t}{r_o^2}$$

$$\tau_o = \frac{\alpha_A t_o}{r_o^2}$$

$$R = \frac{r}{r_o}$$

$$L = \Lambda \rho_w \phi \qquad (Jm-3)$$

where r is the radial position within the medium from the center of the source cylinder.

Two tabular formats are used; the first presents temperatures in degrees Celsius within the medium at various values of dimensionless radii R and time τ, for various values of source time τ_o. The source temperature is shown under R = 1. The second format is a concise summary of temperatures within the source region following cessation of source disturbance for time

$$t = t_o + Nt_o; \; N \geq 0$$

where N need not be an integer. The source temperature in the second type is shown under N = 0.

Index blocks along the lower edge of each table identify the parametric values used: latent heat density (MJ/m^3), source and initial temperatures (^oC), and duration of source τ_o.

TEMPERATURES IN RADIAL HEAT FLOW
****

LATENT HEAT DENSITY, 10 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
1	10.00	8.84	7.79	6.83	5.95	5.12	2.07	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
2	10.00	9.06	8.19	7.42	6.70	6.03	3.44	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
3	10.00	9.17	8.41	7.72	7.07	6.48	4.02	.96	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01
4	10.00	9.19	8.46	7.78	7.16	6.58	4.18	1.08	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01
5	10.00	9.25	8.56	7.94	7.36	6.82	4.64	1.91	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01
6	10.00	9.31	8.67	8.09	7.56	7.06	5.02	2.34	.42	-.00	-.01	-.01	-.01	-.01	-.01	-.01
7	10.00	9.34	8.74	8.18	7.67	7.19	5.23	2.56	.78	-.00	-.01	-.01	-.01	-.01	-.01	-.01
8	10.00	9.36	8.77	8.23	7.73	7.26	5.34	2.68	1.01	-.00	-.01	-.01	-.01	-.01	-.01	-.01
9	10.00	9.37	8.79	8.25	7.76	7.30	5.40	2.74	1.19	.11	-.01	-.01	-.01	-.01	-.01	-.01
10	10.00	9.37	8.80	8.27	7.78	7.32	5.43	2.77	1.31	.32	-.01	-.01	-.01	-.01	-.01	-.01
11	6.07	5.97	5.88	5.71	5.56	5.42	4.55	2.74	1.30	.30	-.00	-.01	-.01	-.01	-.01	-.01
12	4.50	4.45	4.40	4.30	4.22	4.14	3.64	2.50	1.43	.48	-.00	-.01	-.01	-.01	-.01	-.01
13	3.61	3.57	3.54	3.48	3.42	3.37	3.03	2.24	1.41	.57	-.00	-.01	-.01	-.01	-.01	-.01
14	2.97	2.94	2.92	2.88	2.84	2.80	2.56	1.98	1.32	.60	-.00	-.01	-.01	-.01	-.01	-.01
15	2.53	2.51	2.49	2.46	2.43	2.40	2.22	1.76	1.21	.60	-.00	-.01	-.01	-.01	-.01	-.01
16	2.17	2.15	2.14	2.11	2.09	2.07	1.92	1.55	1.09	.56	-.00	-.01	-.01	-.01	-.01	-.01
17	1.89	1.88	1.87	1.85	1.83	1.81	1.69	1.37	.98	.52	-.00	-.01	-.01	-.01	-.01	-.01
18	1.65	1.64	1.63	1.61	1.59	1.58	1.48	1.21	.86	.48	-.00	-.01	-.01	-.01	-.01	-.01
19	1.44	1.43	1.43	1.41	1.40	1.38	1.29	1.06	.76	.43	-.00	-.01	-.01	-.01	-.01	-.01
20	1.27	1.27	1.26	1.24	1.23	1.22	1.14	.94	.68	.39	-.00	-.01	-.01	-.01	-.01	-.01
30	.36	.36	.36	.35	.35	.35	.33	.27	.19	.12	-.00	-.01	-.01	-.01	-.01	-.01
40	.10	.10	.10	.10	.10	.10	.09	.08	.06	.03	-.00	-.00	-.01	-.01	-.01	-.01
50	.03	.03	.03	.03	.03	.03	.03	.02	.02	.01	-.00	-.00	-.01	-.01	-.01	-.01
60	.01	.01	.01	.01	.01	.01	.01	.01	.00	.00	-.00	-.00	-.01	-.01	-.01	-.01
70	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.01	-.01	-.01	-.01
80	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.01	-.01	-.01	-.01
90	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.01	-.01	-.01	-.01
100	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.01	-.01	-.01	-.01
200	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.01	-.01	-.01	-.01
300	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01	-.01
400	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01	-.01
500	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01	-.01
600	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01	-.01
700	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01	-.01
800	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01	-.01
900	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01	-.01
1000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.00	-.01	-.01

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
10	10	-.01	10

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 10 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
10	10.00	9.37	8.80	8.27	7.78	7.32	5.43	2.77	1.31	.32	-.01	-.01	-.01	-.01	-.01	-.01
20	10.00	9.48	9.00	8.56	8.15	7.77	6.20	3.99	2.46	1.35	-.00	-.01	-.01	-.01	-.01	-.01
30	10.00	9.50	9.05	8.64	8.25	7.89	6.41	4.34	2.95	1.94	.52	-.00	-.01	-.01	-.01	-.01
33	4.90	4.87	4.84	4.78	4.73	4.69	4.39	3.65	2.81	2.05	.69	-.00	-.01	-.01	-.01	-.01
36	3.51	3.50	3.48	3.46	3.43	3.41	3.26	2.86	2.35	1.83	.75	-.00	-.01	-.01	-.01	-.01
39	2.74	2.73	2.72	2.70	2.68	2.67	2.57	2.30	1.95	1.56	.71	-.00	-.01	-.01	-.01	-.01
42	2.20	2.19	2.18	2.17	2.16	2.15	2.07	1.88	1.61	1.31	.63	-.00	-.01	-.01	-.01	-.01
45	1.79	1.78	1.78	1.77	1.76	1.75	1.69	1.54	1.33	1.09	.54	-.00	-.01	-.01	-.01	-.01
51	1.21	1.21	1.20	1.20	1.19	1.19	1.15	1.05	.91	.75	.38	-.00	-.01	-.01	-.01	-.01
60	.68	.68	.68	.67	.67	.67	.65	.59	.51	.42	.22	-.00	-.01	-.01	-.01	-.01
70	.36	.36	.36	.36	.35	.35	.34	.31	.27	.22	.12	-.00	-.01	-.01	-.01	-.01
80	.19	.19	.19	.19	.19	.19	.18	.17	.14	.12	.06	-.00	-.01	-.01	-.01	-.01
90	.10	.10	.10	.10	.10	.10	.10	.09	.08	.06	.03	-.00	-.01	-.01	-.01	-.01
100	.05	.05	.05	.05	.05	.05	.05	.05	.04	.03	.02	-.00	-.00	-.01	-.01	-.01
200	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.01	-.01	-.01
300	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.01	-.01	-.01
400	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01
500	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01
600	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01
700	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01
800	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01
900	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01
1000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01
2000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01
3000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
10	10	-.01	30

TEMPERATURES IN RADIAL HEAT FLOW

LATENT HEAT DENSITY, 10 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
10	10.00	9.37	8.83	8.27	7.78	7.32	5.43	2.77	1.31	.32	-.01	-.01	-.01	-.01	-.01	-.01
20	10.00	9.48	9.00	8.56	8.15	7.77	6.20	3.99	2.46	1.35	-.00	-.01	-.01	-.01	-.01	-.01
30	10.00	9.50	9.05	8.64	8.25	7.89	6.41	4.34	2.95	1.94	.52	-.00	-.01	-.01	-.01	-.01
40	10.00	9.55	9.13	8.75	8.40	8.07	6.71	4.80	3.47	2.47	.99	-.00	-.01	-.01	-.01	-.01
50	10.00	9.56	9.16	8.79	8.45	8.13	6.81	4.95	3.63	2.62	1.19	-.00	-.01	-.01	-.01	-.01
60	10.00	9.57	9.17	8.80	8.47	8.15	6.84	4.99	3.69	2.69	1.25	.09	-.01	-.01	-.01	-.01
70	10.00	9.58	9.20	8.84	8.52	8.21	6.95	5.17	3.94	3.01	1.71	.39	-.00	-.01	-.01	-.01
80	10.00	9.60	9.23	8.89	8.58	8.29	7.07	5.37	4.18	3.28	1.98	.61	-.00	-.01	-.01	-.01
90	10.00	9.61	9.25	8.92	8.62	8.34	7.16	5.50	4.33	3.44	2.13	.77	-.00	-.01	-.01	-.01
100	10.00	9.62	9.26	8.94	8.64	8.36	7.21	5.57	4.42	3.53	2.22	.88	-.00	-.01	-.01	-.01
110	3.84	3.83	3.83	3.81	3.80	3.78	3.70	3.46	3.14	2.78	1.99	.90	-.00	-.01	-.01	-.01
120	2.56	2.55	2.55	2.54	2.53	2.53	2.48	2.36	2.19	1.98	1.49	.74	-.00	-.01	-.01	-.01
130	1.81	1.80	1.80	1.80	1.79	1.79	1.76	1.68	1.56	1.43	1.09	.56	-.00	-.01	-.01	-.01
140	1.30	1.30	1.30	1.29	1.29	1.29	1.27	1.21	1.13	1.03	.79	.41	-.00	-.01	-.01	-.01
150	.94	.94	.94	.93	.93	.93	.91	.87	.82	.75	.58	.32	.06	-.00	-.01	-.01
170	.52	.52	.52	.52	.52	.52	.51	.49	.47	.44	.37	.25	-.00	-.00	-.01	-.01
200	.28	.28	.28	.28	.28	.28	.28	.27	.26	.25	.22	.16	.00	-.00	-.01	-.01
300	.05	.05	.05	.05	.05	.05	.05	.05	.05	.05	.04	.03	.00	-.00	-.01	-.01
400	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.00	-.00	-.01	-.01
500	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.01
600	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.01
700	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.01
800	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.01
900	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.01
1000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.01
2000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.01
3000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.01
4000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01
5000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
10	10	-.01	100

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 10 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
100	10.00	9.62	9.26	8.94	8.64	8.36	7.21	5.57	4.42	3.53	2.22	.88	-.00	-.01	-.01	-.01
200	10.00	9.66	9.34	9.06	8.79	8.54	7.50	6.05	5.02	4.22	3.04	1.82	.43	-.00	-.01	-.01
300	10.00	9.67	9.36	9.08	8.83	8.59	7.58	6.17	5.17	4.39	3.22	1.99	.66	.03	-.01	-.01
330	2.85	2.85	2.85	2.84	2.84	2.83	2.81	2.74	2.64	2.52	2.23	1.71	.89	.15	-.00	-.01
360	1.83	1.83	1.83	1.83	1.82	1.82	1.81	1.78	1.74	1.69	1.55	1.29	.80	.21	-.00	-.01
390	1.32	1.32	1.32	1.32	1.32	1.32	1.31	1.29	1.27	1.24	1.16	.99	.66	.21	-.00	-.01
420	1.00	1.00	1.00	1.00	1.00	1.00	.99	.98	.96	.94	.88	.77	.52	.19	-.00	-.01
450	.77	.77	.77	.77	.77	.77	.76	.75	.74	.73	.68	.60	.41	.16	-.00	-.01
510	.46	.46	.46	.46	.46	.46	.46	.45	.45	.44	.41	.36	.25	.10	-.00	-.01
600	.22	.22	.22	.22	.22	.22	.22	.21	.21	.20	.19	.17	.12	.05	-.00	-.01
700	.09	.09	.09	.09	.09	.09	.09	.09	.09	.09	.08	.07	.05	.02	-.00	-.01
800	.04	.04	.04	.04	.04	.04	.04	.04	.04	.04	.04	.03	.02	.01	-.00	-.01
900	.02	.02	.02	.02	.02	.02	.02	.02	.02	.02	.02	.01	.01	.00	-.00	-.01
1000	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.00	.00	-.00	-.01
2000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.01
3000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.01
4000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.01
5000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.01
6000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.01

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
10	10	-.01	300

TEMPERATURES IN RADIAL HEAT FLOW

LATENT HEAT DENSITY, 10 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
100	10.00	9.62	9.26	8.94	8.64	8.36	7.21	5.57	4.42	3.53	2.22	.68	-.00	-.01	-.01	-.01
200	10.00	9.66	9.34	9.06	8.79	8.54	7.50	6.05	5.02	4.22	3.04	1.82	.43	-.00	-.01	-.01
300	10.00	9.67	9.36	9.08	8.83	8.59	7.58	6.17	5.17	4.39	3.22	1.99	.66	.03	-.01	-.01
400	10.00	9.69	9.40	9.14	8.90	8.68	7.74	6.41	5.48	4.75	3.67	2.55	1.34	.44	-.00	-.01
500	10.00	9.70	9.42	9.17	8.94	8.72	7.81	6.53	5.63	4.92	3.87	2.75	1.50	.66	-.00	-.01
600	10.00	9.70	9.43	9.18	8.95	8.73	7.83	6.57	5.67	4.97	3.92	2.81	1.55	.76	-.00	-.01
700	10.00	9.70	9.43	9.19	8.96	8.74	7.85	6.59	5.70	5.01	3.97	2.88	1.70	.94	-.00	-.01
800	10.00	9.71	9.45	9.21	8.99	8.78	7.92	6.71	5.85	5.18	4.18	3.14	1.99	1.24	.06	-.01
900	10.00	9.72	9.47	9.24	9.02	8.82	7.98	6.80	5.96	5.31	4.34	3.31	2.17	1.39	.22	-.00
1000	10.00	9.73	9.48	9.25	9.03	9.84	8.01	6.85	6.02	5.38	4.42	3.40	2.26	1.47	.34	-.00
1100	2.42	2.42	2.42	2.42	2.42	2.42	2.41	2.39	2.37	2.33	2.24	2.06	1.67	1.23	.38	-.00
1200	1.48	1.48	1.48	1.48	1.47	1.47	1.47	1.46	1.45	1.43	1.39	1.30	1.09	.83	.30	-.00
1300	.95	.95	.95	.95	.95	.95	.95	.94	.93	.92	.90	.84	.71	.54	.21	-.00
1400	.62	.62	.62	.62	.62	.62	.62	.61	.61	.60	.58	.55	.46	.35	.14	-.00
1500	.40	.40	.40	.40	.40	.40	.40	.40	.40	.39	.38	.36	.30	.23	.09	-.00
1600	.26	.26	.26	.26	.26	.26	.26	.26	.26	.26	.25	.23	.20	.15	.06	-.00
1700	.17	.17	.17	.17	.17	.17	.17	.17	.17	.17	.16	.15	.13	.10	.04	-.00
1800	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.11	.10	.08	.06	.03	-.00
1900	.07	.07	.07	.07	.07	.07	.07	.07	.07	.07	.07	.06	.05	.04	.02	-.00
2000	.05	.05	.05	.05	.05	.05	.05	.05	.05	.05	.04	.04	.04	.03	.01	-.00
3000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00
4000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00
5000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00
6000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
10	10	-.01	1000

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 10 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
1	10.00	8.27	6.69	5.60	4.59	3.65	-.27	-3.81	-4.68	-4.95	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
2	10.00	8.79	7.68	6.42	5.26	4.19	-.03	-2.34	-3.97	-4.67	-4.97	-5.00	-5.00	-5.00	-5.00	-5.00
3	10.00	8.88	7.86	6.93	6.06	5.25	1.56	-1.77	-3.37	-4.30	-4.89	-4.99	-5.00	-5.00	-5.00	-5.00
4	10.00	8.89	7.87	6.93	6.07	5.26	2.51	-1.03	-3.01	-3.97	-4.78	-4.98	-5.00	-5.00	-5.00	-5.00
5	10.00	8.99	8.07	7.24	6.46	5.74	2.93	-.74	-2.62	-3.71	-4.65	-4.96	-5.00	-5.00	-5.00	-5.00
6	10.00	9.07	8.23	7.45	6.74	6.07	3.21	-.46	-2.18	-3.40	-4.51	-4.93	-5.00	-5.00	-5.00	-5.00
7	10.00	9.12	8.32	7.58	6.90	6.27	3.37	-.25	-1.80	-3.10	-4.37	-4.89	-4.99	-5.00	-5.00	-5.00
8	10.00	9.15	8.38	7.67	7.02	6.41	3.49	-.09	-1.50	-2.83	-4.22	-4.85	-4.99	-5.00	-5.00	-5.00
9	10.00	9.18	8.44	7.75	7.12	6.53	4.09	-.33	-1.57	-2.59	-4.07	-4.80	-4.98	-5.00	-5.00	-5.00
10	10.00	9.20	8.46	7.79	7.16	6.58	4.16	-.12	-1.39	-2.42	-3.93	-4.75	-4.98	-5.00	-5.00	-5.00
11	4.98	4.85	4.73	4.52	4.32	4.13	3.01	.19	-1.23	-2.29	-3.80	-4.69	-4.97	-5.00	-5.00	-5.00
12	2.93	2.86	2.80	2.68	2.57	2.46	1.82	.09	-1.18	-2.20	-3.69	-4.63	-4.96	-5.00	-5.00	-5.00
13	1.80	1.75	1.71	1.64	1.57	1.51	1.12	-.13	-1.21	-2.12	-3.59	-4.58	-4.95	-5.00	-5.00	-5.00
14	1.07	1.05	1.02	.97	.93	.89	.53	-.14	-1.10	-2.07	-3.50	-4.52	-4.94	-4.99	-5.00	-5.00
15	.55	.52	.50	.46	.42	.38	.21	-.35	-1.33	-2.12	-3.44	-4.47	-4.92	-4.99	-5.00	-5.00
16	.19	.18	.17	.15	.14	.13	.06	-.56	-1.48	-2.20	-3.39	-4.42	-4.91	-4.99	-5.00	-5.00
17	.07	.06	.06	.05	.05	.04	.02	-.70	-1.54	-2.24	-3.37	-4.38	-4.90	-4.99	-5.00	-5.00
18	.02	.02	.02	.02	.02	.01	.00	-.80	-1.58	-2.27	-3.35	-4.33	-4.88	-4.98	-5.00	-5.00
19	.00	.00	.00	.00	.00	.00	-.15	-.98	-1.67	-2.30	-3.33	-4.30	-4.87	-4.98	-5.00	-5.00
20	.00	.00	.00	.00	.00	.00	-.34	-1.12	-1.77	-2.35	-3.32	-4.27	-4.85	-4.98	-5.00	-5.00
30	-2.26	-2.27	-2.27	-2.28	-2.29	-2.30	-2.36	-2.51	-2.72	-2.95	-3.44	-4.10	-4.72	-4.93	-5.00	-5.00
40	-3.13	-3.13	-3.14	-3.14	-3.15	-3.15	-3.18	-3.24	-3.34	-3.45	-3.71	-4.12	-4.64	-4.88	-4.99	-5.00
50	-3.57	-3.57	-3.57	-3.58	-3.58	-3.58	-3.59	-3.63	-3.69	-3.76	-3.92	-4.19	-4.60	-4.84	-4.98	-5.00
60	-3.84	-3.84	-3.84	-3.84	-3.84	-3.85	-3.85	-3.88	-3.92	-3.96	-4.07	-4.27	-4.59	-4.81	-4.97	-5.00
70	-4.02	-4.02	-4.02	-4.02	-4.03	-4.03	-4.03	-4.05	-4.08	-4.11	-4.19	-4.34	-4.59	-4.79	-4.96	-5.00
80	-4.15	-4.15	-4.15	-4.16	-4.16	-4.16	-4.16	-4.18	-4.20	-4.22	-4.28	-4.40	-4.61	-4.78	-4.95	-5.00
90	-4.25	-4.26	-4.26	-4.26	-4.26	-4.26	-4.26	-4.27	-4.29	-4.31	-4.35	-4.45	-4.62	-4.77	-4.94	-5.00
100	-4.33	-4.33	-4.33	-4.34	-4.34	-4.34	-4.34	-4.35	-4.36	-4.38	-4.41	-4.49	-4.63	-4.77	-4.93	-5.00
200	-4.68	-4.68	-4.68	-4.68	-4.68	-4.68	-4.68	-4.68	-4.68	-4.69	-4.70	-4.72	-4.76	-4.81	-4.90	-4.99

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
10	10	-5.0	10

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 10 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
10	10.00	9.20	8.46	7.79	7.16	6.58	4.16	-.12	-1.39	-2.42	-3.93	-4.75	-4.98	-5.00	-5.00	-5.00
20	10.00	9.30	8.65	8.06	7.52	7.01	4.90	1.87	-.19	-1.28	-2.97	-4.21	-4.85	-4.98	-5.00	-5.00
30	10.00	9.37	8.79	8.26	7.77	7.31	5.41	2.75	-.11	-.91	-2.19	-3.69	-4.65	-4.92	-5.00	-5.00
33	3.40	3.36	3.32	3.25	3.18	3.12	2.72	1.72	-.05	-.81	-2.06	-3.55	-4.59	-4.90	-4.99	-5.00
36	1.57	1.55	1.53	1.50	1.46	1.43	1.23	.55	-.08	-.66	-2.00	-3.43	-4.52	-4.87	-4.99	-5.00
39	.54	.52	.51	.49	.47	.45	.34	.13	-.22	-1.03	-2.09	-3.36	-4.46	-4.85	-4.99	-5.00
42	.12	.12	.11	.11	.10	.10	.07	.02	-.51	-1.16	-2.17	-3.32	-4.41	-4.82	-4.98	-5.00
45	.03	.03	.02	.02	.02	.02	.01	-.03	-.58	-1.21	-2.21	-3.30	-4.36	-4.79	-4.98	-5.00
51	.00	.00	.00	.00	.00	.00	-.08	-.65	-1.12	-1.56	-2.34	-3.28	-4.28	-4.74	-4.97	-5.00
60	-1.24	-1.24	-1.25	-1.26	-1.28	-1.29	-1.36	-1.54	-1.78	-2.03	-2.57	-3.31	-4.20	-4.67	-4.95	-5.00
70	-2.23	-2.23	-2.24	-2.24	-2.25	-2.25	-2.28	-2.36	-2.47	-2.59	-2.90	-3.41	-4.15	-4.60	-4.93	-5.00
80	-2.74	-2.75	-2.75	-2.75	-2.75	-2.76	-2.77	-2.82	-2.89	-2.98	-3.18	-3.55	-4.14	-4.56	-4.91	-5.00
90	-3.09	-3.09	-3.09	-3.09	-3.09	-3.09	-3.11	-3.14	-3.19	-3.25	-3.40	-3.67	-4.15	-4.53	-4.89	-5.00
100	-3.33	-3.33	-3.33	-3.34	-3.34	-3.34	-3.35	-3.37	-3.41	-3.46	-3.57	-3.78	-4.18	-4.51	-4.87	-5.00
200	-4.26	-4.26	-4.26	-4.26	-4.26	-4.26	-4.26	-4.27	-4.27	-4.28	-4.31	-4.35	-4.46	-4.57	-4.78	-4.97
300	-4.52	-4.52	-4.52	-4.52	-4.52	-4.52	-4.52	-4.53	-4.53	-4.53	-4.54	-4.56	-4.61	-4.66	-4.78	-4.95
400	-4.65	-4.65	-4.65	-4.65	-4.65	-4.65	-4.65	-4.65	-4.65	-4.65	-4.66	-4.67	-4.70	-4.73	-4.80	-4.93

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
10	10	-5.0	30

TEMPERATURES IN RADIAL HEAT FLOW

LATENT HEAT DENSITY, 10 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
10	10.00	9.20	8.46	7.79	7.16	6.58	4.16	-.12	-1.39	-2.42	-3.93	-4.75	-4.98	-5.00	-5.00	-5.00
20	10.00	9.30	8.65	8.06	7.52	7.01	4.90	1.87	-.19	-1.28	-2.97	-4.21	-4.85	-4.98	-5.00	-5.00
30	10.00	9.37	8.79	8.26	7.77	7.31	5.41	2.75	-.11	-.91	-2.19	-3.69	-4.65	-4.92	-5.00	-5.00
40	10.00	9.38	8.81	8.28	7.80	7.35	5.46	2.81	.99	-.31	-1.86	-3.30	-4.44	-4.84	-4.99	-5.00
50	10.00	9.39	8.83	8.31	7.83	7.39	5.55	2.99	1.45	.36	-1.64	-3.05	-4.25	-4.74	-4.97	-5.00
60	10.00	9.43	8.91	8.43	7.99	7.58	5.87	3.47	1.76	.43	-1.19	-2.76	-4.08	-4.65	-4.95	-5.00
70	10.00	9.45	8.95	8.50	8.07	7.68	6.03	3.72	1.92	.47	-.86	-2.48	-3.90	-4.54	-4.93	-5.00
80	10.00	9.47	8.98	8.54	8.12	7.74	6.14	3.89	2.03	.50	-.61	-2.24	-3.73	-4.44	-4.90	-5.00
90	10.00	9.48	9.01	8.57	8.17	7.79	6.23	4.02	2.12	.52	-.39	-2.03	-3.57	-4.33	-4.86	-5.00
100	10.00	9.49	9.02	8.59	8.19	7.82	6.28	4.10	2.56	1.07	-.68	-1.89	-3.42	-4.23	-4.83	-5.00
110	1.81	1.80	1.79	1.77	1.75	1.73	1.62	1.34	.97	.41	-.68	-1.80	-3.30	-4.14	-4.79	-4.99
120	.34	.34	.33	.33	.32	.31	.28	.18	.09	.01	-.92	-1.90	-3.22	-4.05	-4.75	-4.99
130	.03	.03	.03	.03	.03	.03	.02	.01	.00	-.37	-1.06	-2.02	-3.20	-3.98	-4.72	-4.99
140	.00	.00	.00	.00	.00	.00	.00	.00	-.35	-.71	-1.33	-2.12	-3.19	-3.93	-4.68	-4.99
150	.00	.00	.00	.00	.00	.00	.00	-.35	-.70	-1.02	-1.55	-2.24	-3.19	-3.89	-4.64	-4.98
170	-1.46	-1.46	-1.47	-1.47	-1.47	-1.48	-1.50	-1.57	-1.67	-1.78	-2.04	-2.50	-3.25	-3.85	-4.58	-4.97
200	-2.47	-2.47	-2.48	-2.48	-2.48	-2.48	-2.49	-2.52	-2.55	-2.60	-2.72	-2.95	-3.41	-3.86	-4.52	-4.96
300	-3.60	-3.60	-3.60	-3.60	-3.60	-3.60	-3.60	-3.61	-3.62	-3.63	-3.67	-3.74	-3.90	-4.09	-4.46	-4.89
400	-4.02	-4.02	-4.02	-4.02	-4.02	-4.02	-4.02	-4.02	-4.03	-4.03	-4.05	-4.09	-4.17	-4.27	-4.50	-4.84
500	-4.24	-4.24	-4.24	-4.24	-4.24	-4.24	-4.24	-4.24	-4.25	-4.25	-4.26	-4.28	-4.33	-4.40	-4.55	-4.81
600	-4.38	-4.38	-4.38	-4.38	-4.38	-4.38	-4.38	-4.38	-4.39	-4.39	-4.39	-4.41	-4.44	-4.49	-4.59	-4.80
700	-4.48	-4.48	-4.48	-4.48	-4.48	-4.48	-4.48	-4.48	-4.48	-4.48	-4.49	-4.50	-4.52	-4.55	-4.63	-4.80
800	-4.55	-4.55	-4.55	-4.55	-4.55	-4.55	-4.55	-4.55	-4.55	-4.55	-4.56	-4.56	-4.58	-4.61	-4.67	-4.81
900	-4.60	-4.60	-4.60	-4.60	-4.60	-4.60	-4.60	-4.60	-4.60	-4.60	-4.61	-4.61	-4.63	-4.65	-4.70	-4.81
1000	-4.64	-4.64	-4.64	-4.64	-4.64	-4.64	-4.64	-4.65	-4.65	-4.65	-4.65	-4.65	-4.67	-4.68	-4.72	-4.82

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
10	10	-5.0	100

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 10 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
100	10.00	9.49	9.02	8.59	8.19	7.82	6.28	4.10	2.56	1.07	-.68	-1.89	-3.42	-4.23	-4.83	-5.00
200	10.00	9.54	9.12	8.73	8.37	8.04	6.65	4.69	3.31	2.19	.39	-.91	-2.52	-3.48	-4.45	-4.95
300	10.00	9.57	9.17	8.81	8.47	8.16	6.85	5.01	3.70	2.69	.93	-.64	-1.91	-2.92	-4.08	-4.87
330	.81	.80	.80	.80	.79	.79	.76	.68	.56	.41	.07	-.66	-1.86	-2.81	-3.98	-4.83
360	.02	.02	.02	.02	.02	.02	.02	.02	.01	.01	-.32	-1.02	-2.03	-2.81	-3.90	-4.80
390	.00	.00	.00	.00	.00	.00	.00	.00	-.05	-.30	-.73	-1.34	-2.16	-2.84	-3.85	-4.76
420	.00	.00	.00	.00	.00	-.01	-.17	-.44	-.68	-.87	-1.20	-1.65	-2.32	-2.90	-3.82	-4.73
450	-1.51	-1.51	-1.51	-1.51	-1.51	-1.51	-1.52	-1.55	-1.59	-1.64	-1.77	-2.02	-2.50	-2.98	-3.80	-4.70
510	-2.40	-2.40	-2.40	-2.40	-2.40	-2.40	-2.40	-2.42	-2.43	-2.46	-2.51	-2.63	-2.89	-3.20	-3.82	-4.64
600	-3.04	-3.04	-3.04	-3.04	-3.04	-3.04	-3.04	-3.05	-3.06	-3.07	-3.10	-3.16	-3.31	-3.49	-3.90	-4.57
700	-3.44	-3.44	-3.44	-3.44	-3.44	-3.44	-3.44	-3.45	-3.45	-3.46	-3.48	-3.52	-3.61	-3.73	-4.01	-4.54
800	-3.70	-3.70	-3.70	-3.70	-3.70	-3.70	-3.70	-3.71	-3.71	-3.71	-3.73	-3.75	-3.82	-3.90	-4.11	-4.53
900	-3.89	-3.89	-3.89	-3.89	-3.89	-3.89	-3.89	-3.89	-3.89	-3.89	-3.90	-3.92	-3.97	-4.03	-4.19	-4.54
1000	-4.02	-4.02	-4.02	-4.02	-4.02	-4.02	-4.02	-4.03	-4.03	-4.03	-4.04	-4.05	-4.09	-4.14	-4.26	-4.55
2000	-4.59	-4.59	-4.59	-4.59	-4.59	-4.59	-4.59	-4.59	-4.59	-4.59	-4.59	-4.59	-4.60	-4.62	-4.65	-4.74
3000	-4.79	-4.79	-4.79	-4.79	-4.79	-4.79	-4.79	-4.79	-4.79	-4.79	-4.79	-4.79	-4.79	-4.80	-4.82	-4.86

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
10	10	-5.0	300

TEMPERATURES IN RADIAL HEAT FLOW

LATENT HEAT DENSITY, 10 MJ/M^3

TAU \ R	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
100	10.00	9.49	9.02	8.59	8.19	7.82	6.28	4.10	2.56	1.07	-.68	-1.89	-3.42	-4.23	-4.83	-5.00
200	10.00	9.54	9.12	8.73	8.37	8.04	6.65	4.69	3.31	2.19	.39	-.91	-2.52	-3.48	-4.45	-4.95
300	10.00	9.57	9.17	8.81	8.47	8.16	6.85	5.01	3.70	2.69	.93	-.64	-1.91	-2.92	-4.08	-4.87
400	10.00	9.57	9.17	8.81	8.47	8.16	6.85	5.01	3.70	2.69	1.26	.06	-1.70	-2.63	-3.79	-4.75
500	10.00	9.59	9.22	8.88	8.56	8.27	7.04	5.31	4.09	3.14	1.72	.22	-1.31	-2.33	-3.56	-4.63
600	10.00	9.61	9.25	8.92	8.61	8.33	7.14	5.46	4.28	3.36	1.93	.25	-1.01	-2.04	-3.33	-4.51
700	10.00	9.62	9.26	8.94	8.64	8.36	7.20	5.57	4.41	3.51	2.07	.27	-.78	-1.81	-3.13	-4.39
800	10.00	9.62	9.28	8.96	8.67	8.39	7.26	5.65	4.51	3.63	2.31	.47	-.82	-1.62	-2.95	-4.28
900	10.00	9.62	9.28	8.97	8.67	8.40	7.27	5.67	4.54	3.66	2.33	.75	-.70	-1.53	-2.82	-4.17
1000	10.00	9.62	9.28	8.97	8.67	8.40	7.27	5.67	4.54	3.66	2.33	.92	-.56	-1.46	-2.71	-4.08
1100	.15	.15	.15	.15	.15	.15	.15	.13	.12	.10	.05	.00	-.83	-1.50	-2.64	-3.99
1200	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.18	-.63	-1.26	-1.79	-2.69	-3.93
1300	-.64	-.65	-.65	-.65	-.65	-.66	-.67	-.72	-.78	-.85	-1.01	-1.27	-1.68	-2.07	-2.79	-3.89
1400	-1.87	-1.87	-1.87	-1.87	-1.87	-1.87	-1.87	-1.88	-1.89	-1.91	-1.94	-2.02	-2.20	-2.43	-2.94	-3.87
1500	-2.37	-2.37	-2.37	-2.37	-2.37	-2.37	-2.37	-2.38	-2.38	-2.39	-2.42	-2.47	-2.58	-2.73	-3.11	-3.88
1600	-2.71	-2.71	-2.71	-2.71	-2.71	-2.71	-2.71	-2.71	-2.72	-2.72	-2.74	-2.78	-2.86	-2.97	-3.26	-3.92
1700	-2.96	-2.96	-2.96	-2.96	-2.96	-2.96	-2.96	-2.96	-2.97	-2.97	-2.98	-3.01	-3.08	-3.17	-3.40	-3.96
1800	-3.16	-3.16	-3.16	-3.16	-3.16	-3.16	-3.16	-3.16	-3.17	-3.17	-3.18	-3.20	-3.26	-3.33	-3.53	-4.01
1900	-3.32	-3.32	-3.32	-3.32	-3.32	-3.32	-3.32	-3.33	-3.33	-3.33	-3.34	-3.36	-3.41	-3.47	-3.64	-4.06
2000	-3.46	-3.46	-3.46	-3.46	-3.46	-3.46	-3.46	-3.47	-3.47	-3.47	-3.48	-3.49	-3.53	-3.59	-3.73	-4.11
3000	-4.25	-4.25	-4.25	-4.25	-4.25	-4.25	-4.25	-4.25	-4.25	-4.25	-4.25	-4.26	-4.27	-4.29	-4.35	-4.52
4000	-4.60	-4.60	-4.60	-4.60	-4.60	-4.60	-4.60	-4.60	-4.60	-4.61	-4.61	-4.61	-4.62	-4.63	-4.66	-4.74
5000	-4.79	-4.79	-4.79	-4.79	-4.79	-4.79	-4.79	-4.79	-4.79	-4.79	-4.79	-4.79	-4.80	-4.80	-4.82	-4.86
6000	-4.89	-4.89	-4.89	-4.89	-4.89	-4.89	-4.89	-4.89	-4.89	-4.89	-4.89	-4.89	-4.89	-4.90	-4.90	-4.93

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
10	10	-5.0	1000

TEMPERATURES IN RADIAL HEAT FLOW

LATENT HEAT DENSITY, 10 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
1	10.00	7.17	4.58	2.20	-.00	-.10	-3.08	-8.07	-9.51	-9.92	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
2	10.00	8.25	6.64	5.56	4.56	3.62	-.43	-6.37	-8.51	-9.50	-9.95	-10.00	-10.00	-10.00	-10.00	-10.00
3	10.00	8.56	7.25	6.07	4.97	3.95	-.26	-5.16	-7.68	-9.01	-9.84	-9.99	-10.00	-10.00	-10.00	-10.00
4	10.00	8.68	7.48	6.26	5.13	4.08	-.16	-4.22	-6.93	-8.48	-9.67	-9.97	-10.00	-10.00	-10.00	-10.00
5	10.00	8.76	7.63	6.38	5.23	4.16	-.10	-3.57	-6.33	-8.02	-9.48	-9.94	-10.00	-10.00	-10.00	-10.00
6	10.00	8.82	7.74	6.47	5.31	4.22	-.05	-3.04	-5.81	-7.58	-9.27	-9.89	-9.99	-10.00	-10.00	-10.00
7	10.00	8.86	7.82	6.54	5.36	4.26	-.00	-2.61	-5.37	-7.19	-9.05	-9.84	-9.99	-10.00	-10.00	-10.00
8	10.00	8.89	7.87	6.93	6.06	5.26	.70	-2.63	-5.05	-6.87	-8.85	-9.77	-9.98	-10.00	-10.00	-10.00
9	10.00	8.89	7.87	6.93	6.07	5.26	1.70	-2.32	-4.79	-6.58	-8.64	-9.70	-9.98	-10.00	-10.00	-10.00
10	10.00	8.89	7.87	6.93	6.07	5.26	2.22	-1.96	-4.61	-6.36	-8.46	-9.63	-9.97	-10.00	-10.00	-10.00
11	3.12	2.97	2.82	2.56	2.32	2.10	.98	-1.87	-4.45	-6.16	-8.28	-9.55	-9.95	-10.00	-10.00	-10.00
12	1.05	.99	.95	.86	.78	.70	-.09	-2.27	-4.31	-6.00	-8.12	-9.47	-9.94	-9.99	-10.00	-10.00
13	.14	.12	.11	.09	.07	.05	-.63	-2.67	-4.43	-5.90	-7.98	-9.39	-9.92	-9.99	-10.00	-10.00
14	.00	.00	.00	-.06	-.30	-.52	-1.44	-3.05	-4.59	-5.90	-7.67	-9.31	-9.91	-9.99	-10.00	-10.00
15	-.97	-1.04	-1.11	-1.23	-1.35	-1.45	-2.07	-3.43	-4.76	-5.94	-7.78	-9.24	-9.89	-9.99	-10.00	-10.00
16	-2.22	-2.27	-2.31	-2.38	-2.45	-2.52	-2.92	-3.89	-4.99	-6.01	-7.72	-9.17	-9.87	-9.98	-10.00	-10.00
17	-3.03	-3.06	-3.09	-3.15	-3.20	-3.25	-3.55	-4.31	-5.22	-6.12	-7.68	-9.11	-9.85	-9.98	-10.00	-10.00
18	-3.68	-3.70	-3.73	-3.77	-3.81	-3.85	-4.09	-4.71	-5.47	-6.24	-7.67	-9.05	-9.83	-9.98	-10.00	-10.00
19	-4.20	-4.22	-4.24	-4.28	-4.31	-4.34	-4.54	-5.05	-5.70	-6.37	-7.67	-9.00	-9.81	-9.97	-10.00	-10.00
20	-4.61	-4.63	-4.65	-4.68	-4.71	-4.73	-4.90	-5.34	-5.90	-6.50	-7.68	-8.96	-9.79	-9.97	-10.00	-10.00
30	-6.83	-6.83	-6.84	-6.85	-6.86	-6.87	-6.92	-7.07	-7.28	-7.51	-8.04	-8.81	-9.61	-9.90	-9.99	-10.00
40	-7.73	-7.74	-7.74	-7.74	-7.75	-7.75	-7.78	-7.86	-7.96	-8.09	-8.39	-8.88	-9.52	-9.83	-9.98	-10.00
50	-8.23	-8.24	-8.24	-8.24	-8.24	-8.25	-8.26	-8.31	-8.38	-8.45	-8.64	-8.98	-9.48	-9.78	-9.97	-10.00
60	-8.55	-8.55	-8.55	-8.56	-8.56	-8.56	-8.57	-8.60	-8.65	-8.70	-8.83	-9.07	-9.47	-9.74	-9.96	-10.00
70	-8.77	-8.77	-8.77	-8.78	-8.78	-8.78	-8.79	-8.81	-8.84	-8.88	-8.98	-9.16	-9.48	-9.72	-9.94	-10.00
80	-8.93	-8.94	-8.94	-8.94	-8.94	-8.94	-8.95	-8.96	-8.99	-9.02	-9.09	-9.23	-9.49	-9.71	-9.93	-10.00
90	-9.06	-9.06	-9.06	-9.06	-9.06	-9.06	-9.07	-9.08	-9.10	-9.12	-9.18	-9.30	-9.51	-9.70	-9.92	-10.00
100	-9.16	-9.16	-9.16	-9.16	-9.16	-9.16	-9.16	-9.17	-9.19	-9.21	-9.26	-9.35	-9.53	-9.70	-9.91	-10.00
200	-9.59	-9.59	-9.59	-9.59	-9.59	-9.59	-9.59	-9.59	-9.60	-9.60	-9.61	-9.64	-9.69	-9.75	-9.87	-9.98

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
10	10	-10.0	10

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 10 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
10	10.00	8.89	7.87	6.93	6.07	5.26	2.22	-1.96	-4.61	-6.36	-8.46	-9.63	-9.97	-10.00	-10.00	-10.00
20	10.00	9.09	8.26	7.50	6.80	6.14	3.27	-.57	-2.81	-4.62	-7.02	-8.83	-9.78	-9.97	-10.00	-10.00
30	10.00	9.16	8.40	7.70	7.05	6.45	3.52	-.16	-1.88	-3.63	-6.06	-8.12	-9.50	-9.89	-9.99	-10.00
33	1.30	1.25	1.20	1.10	1.01	.93	.51	-.61	-2.32	-3.64	-5.86	-7.94	-9.41	-9.85	-9.99	-10.00
36	.02	.02	.02	.01	.01	.01	-.32	-1.65	-2.84	-3.94	-5.83	-7.79	-9.32	-9.82	-9.99	-10.00
39	-.93	-.98	-1.02	-1.10	-1.16	-1.23	-1.61	-2.49	-3.42	-4.29	-5.88	-7.69	-9.23	-9.78	-9.98	-10.00
42	-2.73	-2.75	-2.77	-2.80	-2.83	-2.86	-3.03	-3.49	-4.08	-4.71	-6.01	-7.63	-9.16	-9.74	-9.98	-10.00
45	-3.74	-3.75	-3.76	-3.78	-3.80	-3.82	-3.94	-4.26	-4.68	-5.15	-6.18	-7.61	-9.09	-9.70	-9.97	-10.00
51	-4.98	-4.99	-5.00	-5.01	-5.02	-5.03	-5.10	-5.29	-5.56	-5.86	-6.57	-7.66	-8.99	-9.63	-9.96	-10.00
60	-6.09	-6.09	-6.10	-6.11	-6.11	-6.12	-6.16	-6.27	-6.43	-6.61	-7.06	-7.82	-8.90	-9.53	-9.93	-10.00
70	-6.84	-6.84	-6.84	-6.85	-6.85	-6.86	-6.88	-6.95	-7.06	-7.18	-7.48	-8.01	-8.88	-9.46	-9.90	-10.00
80	-7.34	-7.34	-7.34	-7.34	-7.35	-7.35	-7.37	-7.42	-7.49	-7.58	-7.79	-8.19	-8.89	-9.41	-9.87	-10.00
90	-7.70	-7.70	-7.70	-7.70	-7.70	-7.71	-7.72	-7.76	-7.81	-7.88	-8.04	-8.35	-8.92	-9.38	-9.85	-10.00
100	-7.97	-7.97	-7.97	-7.97	-7.98	-7.98	-7.99	-8.02	-8.06	-8.11	-8.24	-8.49	-8.96	-9.36	-9.82	-10.00
200	-9.07	-9.07	-9.07	-9.07	-9.07	-9.07	-9.07	-9.08	-9.09	-9.10	-9.13	-9.18	-9.31	-9.46	-9.72	-9.96
300	-9.39	-9.39	-9.39	-9.39	-9.39	-9.39	-9.39	-9.40	-9.40	-9.41	-9.42	-9.44	-9.50	-9.57	-9.72	-9.93
400	-9.55	-9.55	-9.55	-9.55	-9.55	-9.55	-9.55	-9.55	-9.55	-9.56	-9.56	-9.58	-9.61	-9.65	-9.75	-9.91

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
10	10	-10.0	30

TEMPERATURES IN RADIAL HEAT FLOW

LATENT HEAT DENSITY, 10 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
10	10.00	8.69	7.87	6.93	6.07	5.26	2.22	-1.96	-4.61	-6.36	-8.46	-9.63	-9.97	-10.00	-10.00	-10.00
20	10.00	9.09	8.26	7.50	6.80	6.14	3.27	-.57	-2.81	-4.62	-7.02	-8.83	-9.78	-9.97	-10.00	-10.00
30	10.00	9.16	8.40	7.70	7.05	6.45	3.52	-.16	-1.88	-3.63	-6.06	-8.12	-9.50	-9.89	-9.99	-10.00
40	10.00	9.20	8.47	7.80	7.18	6.60	4.18	-.07	-1.68	-3.05	-5.40	-7.55	-9.20	-9.77	-9.98	-10.00
50	10.00	9.20	8.47	7.80	7.18	6.60	4.18	1.38	-.64	-2.81	-5.00	-7.12	-8.91	-9.63	-9.96	-10.00
60	10.00	9.26	8.58	7.95	7.38	6.84	4.60	1.68	-.39	-2.31	-4.60	-6.77	-8.66	-9.48	-9.93	-10.00
70	10.00	9.28	8.62	8.02	7.46	6.94	4.77	1.79	-.31	-1.96	-4.24	-6.43	-8.42	-9.34	-9.89	-10.00
80	10.00	9.30	8.66	8.07	7.52	7.01	4.90	1.87	-.25	-1.69	-3.94	-6.14	-8.19	-9.19	-9.85	-10.00
90	10.00	9.31	8.68	8.11	7.57	7.07	5.00	1.93	-.21	-1.47	-3.69	-5.89	-7.98	-9.05	-9.81	-10.00
100	10.00	9.32	8.71	8.14	7.61	7.12	5.09	1.98	-.17	-1.28	-3.47	-5.66	-7.79	-8.91	-9.76	-9.99
110	.10	.10	.09	.08	.08	.07	.04	-.29	-1.20	-2.05	-3.66	-5.55	-7.62	-8.78	-9.70	-9.99
120	-1.60	-1.62	-1.64	-1.66	-1.69	-1.71	-1.85	-2.22	-2.68	-3.17	-4.21	-5.66	-7.51	-8.66	-9.65	-9.99
130	-3.56	-3.57	-3.57	-3.58	-3.59	-3.60	-3.66	-3.81	-4.03	-4.28	-4.89	-5.92	-7.48	-8.57	-9.60	-9.98
140	-4.58	-4.59	-4.59	-4.60	-4.60	-4.61	-4.65	-4.74	-4.88	-5.45	-5.47	-6.23	-7.51	-8.51	-9.55	-9.98
150	-5.28	-5.28	-5.28	-5.29	-5.29	-5.30	-5.32	-5.40	-5.50	-5.62	-5.93	-6.52	-7.58	-8.47	-9.50	-9.97
170	-6.20	-6.20	-6.20	-6.21	-6.21	-6.21	-6.23	-6.27	-6.33	-6.41	-6.61	-6.99	-7.75	-8.47	-9.42	-9.96
200	-7.03	-7.03	-7.03	-7.04	-7.04	-7.04	-7.05	-7.07	-7.11	-7.16	-7.28	-7.51	-8.01	-8.53	-9.35	-9.94
300	-8.26	-8.26	-8.26	-8.26	-8.26	-8.26	-8.26	-8.27	-8.28	-8.30	-8.34	-8.42	-8.61	-8.84	-9.30	-9.85
400	-8.76	-8.76	-8.76	-8.76	-8.76	-8.76	-8.76	-8.77	-8.77	-8.78	-8.80	-8.84	-8.94	-9.07	-9.35	-9.79
500	-9.03	-9.04	-9.04	-9.04	-9.04	-9.04	-9.04	-9.04	-9.04	-9.05	-9.06	-9.09	-9.15	-9.23	-9.42	-9.76
600	-9.21	-9.21	-9.21	-9.21	-9.21	-9.21	-9.21	-9.21	-9.22	-9.22	-9.23	-9.25	-9.29	-9.34	-9.48	-9.75
700	-9.33	-9.33	-9.33	-9.33	-9.33	-9.33	-9.33	-9.33	-9.34	-9.34	-9.34	-9.36	-9.39	-9.43	-9.53	-9.74
800	-9.42	-9.42	-9.42	-9.42	-9.42	-9.42	-9.42	-9.42	-9.42	-9.43	-9.43	-9.44	-9.46	-9.49	-9.57	-9.75
900	-9.49	-9.49	-9.49	-9.49	-9.49	-9.49	-9.49	-9.49	-9.49	-9.49	-9.50	-9.50	-9.52	-9.55	-9.61	-9.76
1000	-9.54	-9.54	-9.54	-9.54	-9.54	-9.54	-9.54	-9.54	-9.55	-9.55	-9.55	-9.56	-9.57	-9.59	-9.64	-9.77

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
10	10	-10.0	100

96

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 10 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
100	10.00	9.32	8.71	8.14	7.61	7.12	5.09	1.98	-.17	-1.28	-3.47	-5.66	-7.79	-8.91	-9.76	-9.99
200	10.00	9.38	8.81	8.28	7.80	7.35	5.46	2.81	1.14	-.11	-2.36	-4.35	-6.49	-7.82	-9.20	-9.93
300	10.00	9.43	8.90	8.42	7.98	7.56	5.83	3.40	1.71	.42	-1.59	-3.58	-5.74	-7.13	-8.71	-9.81
330	.00	.00	.00	.00	.00	.00	-.21	-.83	-1.33	-1.60	-2.69	-3.93	-5.67	-6.98	-8.58	-9.76
360	-3.57	-3.57	-3.57	-3.58	-3.58	-3.59	-3.61	-3.68	-3.78	-3.91	-4.22	-4.82	-5.94	-6.97	-8.47	-9.72
390	-4.85	-4.85	-4.85	-4.86	-4.86	-4.86	-4.88	-4.91	-4.97	-5.04	-5.22	-5.57	-6.32	-7.10	-8.41	-9.67
420	-5.63	-5.63	-5.64	-5.64	-5.64	-5.64	-5.65	-5.68	-5.71	-5.76	-5.88	-6.13	-6.67	-7.27	-8.39	-9.62
450	-6.18	-6.18	-6.18	-6.18	-6.19	-6.19	-6.19	-6.21	-6.24	-6.27	-6.36	-6.55	-6.96	-7.44	-8.40	-9.58
510	-6.92	-6.92	-6.92	-6.92	-6.92	-6.92	-6.93	-6.94	-6.96	-6.98	-7.03	-7.15	-7.42	-7.75	-8.46	-9.50
600	-7.59	-7.59	-7.59	-7.59	-7.59	-7.59	-7.60	-7.60	-7.61	-7.63	-7.66	-7.73	-7.89	-8.10	-8.59	-9.43
700	-8.05	-8.05	-8.05	-8.05	-8.05	-8.05	-8.06	-8.06	-8.07	-8.07	-8.10	-8.14	-8.25	-8.39	-8.73	-9.39
800	-8.36	-8.36	-8.36	-8.36	-8.36	-8.36	-8.36	-8.37	-8.37	-8.38	-8.39	-8.43	-8.50	-8.60	-8.86	-9.38
900	-8.59	-8.59	-8.59	-8.59	-8.59	-8.59	-8.59	-8.59	-8.59	-8.60	-8.61	-8.63	-8.69	-8.77	-8.96	-9.39
1000	-8.76	-8.76	-8.76	-8.76	-8.76	-8.76	-8.76	-8.76	-8.76	-8.76	-8.77	-8.79	-8.84	-8.90	-9.05	-9.41
2000	-9.47	-9.47	-9.47	-9.47	-9.47	-9.47	-9.47	-9.47	-9.47	-9.47	-9.47	-9.48	-9.49	-9.50	-9.55	-9.66
3000	-9.72	-9.72	-9.72	-9.72	-9.72	-9.72	-9.72	-9.72	-9.72	-9.72	-9.73	-9.73	-9.73	-9.74	-9.76	-9.82

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
10	10	-10.0	300

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 10 MJ/M^3

TAU	R 1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
100	10.00	9.32	8.71	8.14	7.61	7.12	5.09	1.98	-.17	-1.28	-3.47	-5.66	-7.79	-8.91	-9.76	-9.99
200	10.00	9.38	8.81	8.28	7.80	7.35	5.46	2.81	1.14	-.11	-2.36	-4.35	-6.49	-7.82	-9.20	-9.93
300	10.00	9.43	8.90	8.42	7.98	7.56	5.83	3.40	1.71	.42	-1.59	-3.58	-5.74	-7.13	-8.71	-9.81
400	10.00	9.45	8.95	8.48	8.06	7.66	6.00	3.66	1.88	.46	-1.15	-3.08	-5.20	-6.60	-8.29	-9.65
500	10.00	9.47	8.98	8.53	8.11	7.73	6.11	3.84	2.00	.49	-.83	-2.71	-4.79	-6.20	-7.94	-9.48
600	10.00	9.48	9.00	8.56	8.16	7.78	6.20	3.98	2.10	.52	-.59	-2.43	-4.48	-5.87	-7.65	-9.31
700	10.00	9.49	9.02	8.59	8.20	7.83	6.28	4.11	2.57	.96	-.83	-2.21	-4.22	-5.60	-7.39	-9.14
800	10.00	9.49	9.02	8.59	8.20	7.83	6.28	4.11	2.57	1.41	-.24	-2.11	-4.05	-5.40	-7.18	-8.99
900	10.00	9.50	9.05	8.63	8.24	7.88	6.37	4.25	2.75	1.67	.30	-1.94	-3.89	-5.23	-7.00	-8.85
1000	10.00	9.51	9.06	8.65	8.27	7.92	6.44	4.35	2.87	1.79	.32	-1.75	-3.70	-5.04	-6.83	-8.72
1100	-2.72	-2.72	-2.73	-2.73	-2.73	-2.73	-2.75	-2.80	-2.86	-2.94	-3.15	-3.56	-4.39	-5.24	-6.74	-8.60
1200	-4.83	-4.83	-4.83	-4.83	-4.83	-4.83	-4.84	-4.86	-4.88	-4.91	-4.98	-5.14	-5.50	-5.94	-6.91	-8.52
1300	-5.81	-5.81	-5.81	-5.81	-5.81	-5.81	-5.82	-5.83	-5.84	-5.86	-5.90	-5.99	-6.21	-6.49	-7.17	-8.48
1400	-6.44	-6.44	-6.44	-6.44	-6.44	-6.44	-6.44	-6.45	-6.45	-6.47	-6.50	-6.56	-6.72	-6.92	-7.42	-8.49
1500	-6.88	-6.88	-6.88	-6.88	-6.88	-6.88	-6.89	-6.89	-6.90	-6.91	-6.93	-6.98	-7.09	-7.25	-7.64	-8.54
1600	-7.22	-7.22	-7.22	-7.22	-7.22	-7.22	-7.23	-7.23	-7.24	-7.24	-7.26	-7.30	-7.39	-7.51	-7.83	-8.59
1700	-7.50	-7.50	-7.50	-7.50	-7.50	-7.50	-7.50	-7.50	-7.51	-7.51	-7.53	-7.56	-7.63	-7.73	-8.00	-8.66
1800	-7.72	-7.72	-7.72	-7.72	-7.72	-7.72	-7.72	-7.73	-7.73	-7.74	-7.75	-7.77	-7.84	-7.92	-8.15	-8.73
1900	-7.91	-7.91	-7.91	-7.91	-7.91	-7.91	-7.92	-7.92	-7.92	-7.92	-7.94	-7.96	-8.01	-8.09	-8.28	-8.79
2000	-8.08	-8.08	-8.08	-8.08	-8.08	-8.08	-8.08	-8.08	-8.08	-8.09	-8.10	-8.12	-8.16	-8.23	-8.40	-8.86
3000	-9.04	-9.04	-9.04	-9.04	-9.04	-9.04	-9.04	-9.05	-9.05	-9.05	-9.05	-9.06	-9.08	-9.11	-9.18	-9.39
4000	-9.50	-9.50	-9.50	-9.50	-9.50	-9.50	-9.50	-9.50	-9.50	-9.50	-9.50	-9.51	-9.52	-9.53	-9.57	-9.68
5000	-9.73	-9.73	-9.73	-9.73	-9.73	-9.73	-9.73	-9.73	-9.73	-9.74	-9.74	-9.74	-9.74	-9.75	-9.77	-9.83
6000	-9.86	-9.86	-9.86	-9.86	-9.86	-9.86	-9.86	-9.86	-9.86	-9.86	-9.86	-9.86	-9.86	-9.87	-9.88	-9.91

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU$_0$
10	10	-10.0	1000

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 10 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
1	30.00	26.80	23.88	21.29	18.88	16.65	8.39	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
2	30.00	27.44	25.10	22.98	21.01	19.17	11.81	2.97	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01
3	30.00	27.71	25.61	23.71	21.94	20.30	13.69	5.53	.95	-.00	-.01	-.01	-.01	-.01	-.01	-.01
4	30.00	27.90	25.99	24.24	22.61	21.10	14.95	6.91	2.68	-.00	-.01	-.01	-.01	-.01	-.01	-.01
5	30.00	28.00	26.18	24.51	22.97	21.53	15.61	7.65	2.86	.31	-.00	-.01	-.01	-.01	-.01	-.01
6	30.00	28.08	26.33	24.72	23.24	21.85	16.16	8.55	4.07	1.15	-.00	-.01	-.01	-.01	-.01	-.01
7	30.00	28.16	26.48	24.94	23.51	22.18	16.71	9.39	4.96	1.93	-.00	-.01	-.01	-.01	-.01	-.01
8	30.00	28.22	26.60	25.11	23.74	22.46	17.17	10.04	5.60	2.56	-.00	-.01	-.01	-.01	-.01	-.01
9	30.00	28.28	26.71	25.27	23.93	22.69	17.56	10.58	6.10	3.08	-.00	-.01	-.01	-.01	-.01	-.01
10	30.00	28.32	26.79	25.38	24.08	22.87	17.85	10.98	6.47	3.48	-.00	-.01	-.01	-.01	-.01	-.01
11	19.62	19.36	19.12	18.69	18.28	17.91	15.64	10.82	6.67	3.79	.56	-.01	-.01	-.01	-.01	-.01
12	15.45	15.30	15.17	14.91	14.68	14.46	13.08	9.82	6.47	3.68	.28	-.00	-.01	-.01	-.01	-.01
13	12.94	12.83	12.73	12.56	12.39	12.24	11.25	8.83	6.16	3.83	.58	-.00	-.01	-.01	-.01	-.01
14	11.02	10.95	10.88	10.74	10.62	10.51	9.77	7.92	5.79	3.87	.84	-.00	-.01	-.01	-.01	-.01
15	9.64	9.58	9.53	9.42	9.33	9.24	8.66	7.19	5.45	3.83	1.04	-.00	-.01	-.01	-.01	-.01
16	8.50	8.45	8.41	8.33	8.25	8.18	7.72	6.54	5.11	3.72	1.19	-.00	-.01	-.01	-.01	-.01
17	7.63	7.59	7.55	7.48	7.42	7.36	6.98	6.01	4.80	3.60	1.29	-.00	-.01	-.01	-.01	-.01
18	6.87	6.84	6.81	6.75	6.70	6.65	6.34	5.52	4.49	3.44	1.35	-.00	-.01	-.01	-.01	-.01
19	6.24	6.21	6.19	6.14	6.10	6.06	5.79	5.09	4.20	3.28	1.38	-.00	-.01	-.01	-.01	-.01
20	5.73	5.71	5.68	5.64	5.61	5.57	5.34	4.74	3.95	3.12	1.38	-.00	-.01	-.01	-.01	-.01
30	2.80	2.79	2.78	2.76	2.75	2.74	2.65	2.41	2.09	1.71	.91	-.00	-.01	-.01	-.01	-.01
40	1.47	1.47	1.46	1.45	1.45	1.44	1.40	1.27	1.10	.91	.50	.04	-.01	-.01	-.01	-.01
50	.78	.78	.77	.77	.77	.76	.74	.68	.59	.49	.27	.02	-.01	-.01	-.01	-.01
60	.44	.44	.44	.44	.44	.44	.42	.40	.36	.32	.22	.05	-.00	-.01	-.01	-.01
70	.29	.29	.29	.29	.29	.29	.28	.27	.25	.22	.17	.04	-.00	-.01	-.01	-.01
80	.20	.20	.20	.20	.20	.20	.20	.19	.18	.16	.12	.03	-.00	-.01	-.01	-.01
90	.15	.15	.15	.15	.15	.15	.14	.14	.13	.12	.09	.03	-.00	-.01	-.01	-.01
100	.11	.11	.11	.11	.11	.11	.10	.10	.09	.08	.06	.02	-.00	-.01	-.01	-.01
200	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.01	-.01
300	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.01	-.01
400	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.01	-.01
500	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.01	-.01
600	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.01	-.01
700	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.01	-.01
800	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.01	-.01
900	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.01	-.01
1000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.01	-.01

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
10	30	-.01	10

TEMPERATURES IN RADIAL HEAT FLOW

LATENT HEAT DENSITY, 10 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
10	30.00	28.32	26.79	25.38	24.08	22.87	17.85	10.98	6.47	3.48	-.00	-.01	-.01	-.01	-.01	-.01
20	30.00	28.55	27.23	26.02	24.90	23.85	19.51	13.48	9.39	6.41	2.47	-.00	-.01	-.01	-.01	-.01
30	30.00	28.66	27.43	26.31	25.26	24.29	20.25	14.59	10.66	7.72	3.68	.44	-.01	-.01	-.01	-.01
33	16.01	15.92	15.84	15.68	15.54	15.41	14.56	12.44	10.03	7.78	4.15	.79	-.01	-.01	-.01	-.01
36	12.04	11.99	11.95	11.87	11.79	11.73	11.28	10.12	8.66	7.15	4.30	1.11	-.00	-.01	-.01	-.01
39	9.78	9.75	9.72	9.67	9.63	9.58	9.29	8.53	7.52	6.43	4.20	1.34	-.00	-.01	-.01	-.01
42	8.23	8.21	8.19	8.15	8.12	8.09	7.88	7.33	6.59	5.76	3.97	1.47	-.00	-.01	-.01	-.01
45	7.10	7.08	7.07	7.04	7.01	6.99	6.83	6.41	5.83	5.18	3.70	1.51	-.00	-.01	-.01	-.01
51	5.52	5.51	5.50	5.48	5.46	5.45	5.34	5.06	4.67	4.22	3.13	1.44	-.00	-.01	-.01	-.01
60	3.97	3.97	3.96	3.95	3.94	3.93	3.86	3.68	3.43	3.12	2.37	1.19	-.00	-.01	-.01	-.01
70	2.84	2.84	2.83	2.83	2.82	2.81	2.77	2.64	2.47	2.25	1.73	.90	-.00	-.01	-.01	-.01
80	2.05	2.05	2.05	2.04	2.04	2.03	2.00	1.91	1.79	1.64	1.27	.65	-.00	-.00	-.01	-.01
90	1.50	1.50	1.50	1.49	1.49	1.49	1.47	1.41	1.33	1.23	1.00	.61	-.00	-.00	-.01	-.01
100	1.15	1.15	1.14	1.14	1.14	1.14	1.12	1.09	1.03	.97	.82	.55	.00	-.00	-.01	-.01
200	.19	.19	.19	.19	.19	.19	.19	.19	.18	.17	.15	.11	.02	-.00	-.01	-.01
300	.04	.04	.04	.04	.04	.04	.04	.04	.03	.03	.03	.02	.00	-.00	-.01	-.01
400	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.00	.00	-.00	-.00	-.01
500	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.01
600	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.01
700	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.01
800	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.01
900	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.01
1000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.01
2000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.01
3000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.01

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
10	30	-.01	30

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 10 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
10	30.00	28.32	26.79	25.38	24.08	22.87	17.85	10.98	6.47	3.48	-.00	-.01	-.01	-.01	-.01	-.01
20	30.00	28.55	27.23	26.02	24.90	23.85	19.51	13.48	9.39	6.41	2.47	-.00	-.01	-.01	-.01	-.01
30	30.00	28.66	27.43	26.31	25.26	24.29	20.25	14.59	10.66	7.72	3.68	.44	-.01	-.01	-.01	-.01
40	30.00	28.73	27.58	26.51	25.53	24.61	20.80	15.46	11.75	8.97	5.11	1.56	-.00	-.01	-.01	-.01
50	30.00	28.79	27.69	26.67	25.73	24.86	21.22	16.11	12.54	9.82	5.92	2.34	-.00	-.01	-.01	-.01
60	30.00	28.83	27.76	26.77	25.86	25.01	21.47	16.50	13.00	10.32	6.39	2.83	.16	-.00	-.01	-.01
70	30.00	28.85	27.80	26.84	25.94	25.11	21.64	16.77	13.34	10.72	6.90	3.30	.05	-.00	-.01	-.01
80	30.00	28.88	27.85	26.91	26.04	25.22	21.84	17.08	13.73	11.18	7.47	3.94	.45	-.00	-.01	-.01
90	30.00	28.90	27.90	26.98	26.13	25.34	22.03	17.38	14.11	11.61	7.97	4.42	.89	-.00	-.01	-.01
100	30.00	28.93	27.95	27.04	26.21	25.43	22.19	17.64	14.43	11.97	8.36	4.79	1.28	-.00	-.01	-.01
110	12.89	12.86	12.84	12.80	12.76	12.73	12.49	11.84	10.98	10.02	7.89	4.92	1.58	-.00	-.01	-.01
120	9.43	9.42	9.41	9.39	9.37	9.35	9.24	8.92	8.46	7.94	6.66	4.53	1.71	-.00	-.01	-.01
130	7.48	7.47	7.46	7.45	7.44	7.42	7.35	7.14	6.84	6.48	5.59	3.98	1.67	.14	-.01	-.01
140	6.13	6.12	6.12	6.11	6.10	6.09	6.03	5.88	5.66	5.39	4.71	3.47	1.37	.09	-.01	-.01
150	5.11	5.11	5.10	5.10	5.09	5.08	5.04	4.92	4.75	4.55	4.03	3.07	1.45	.19	-.01	-.01
170	3.74	3.73	3.73	3.73	3.72	3.72	3.69	3.62	3.52	3.40	3.08	2.49	1.42	.33	-.00	-.01
200	2.58	2.58	2.58	2.57	2.57	2.57	2.56	2.52	2.46	2.40	2.22	1.89	1.21	.40	-.00	-.01
300	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.01	1.00	.97	.92	.80	.55	.25	-.00	-.01
400	.44	.44	.44	.44	.44	.44	.44	.44	.43	.42	.40	.35	.24	.11	-.00	-.01
500	.19	.19	.19	.19	.19	.19	.19	.19	.19	.18	.17	.15	.10	.05	-.00	-.01
600	.08	.08	.08	.08	.08	.08	.08	.08	.08	.08	.07	.06	.04	.02	-.00	-.01
700	.04	.04	.04	.04	.04	.04	.04	.04	.03	.03	.03	.03	.02	.01	-.00	-.01
800	.02	.02	.02	.02	.02	.02	.02	.02	.01	.01	.01	.01	.01	.00	-.00	-.01
900	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.00	.00	-.00	-.01
1000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.01
2000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.01
3000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.01
4000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.01
5000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.01

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
10	30	-.01	100

101

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 10 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
100	30.00	28.93	27.95	27.04	26.21	25.43	22.19	17.64	14.43	11.97	8.36	4.79	1.28	-.00	-.01	-.01
200	30.00	29.04	28.15	27.34	26.59	25.90	22.98	18.69	15.99	13.75	10.43	7.03	3.52	1.26	-.00	-.01
300	30.00	29.09	28.26	27.49	26.78	26.12	23.37	19.50	16.75	14.63	11.44	8.10	4.44	2.11	-.00	-.01
330	10.40	10.39	10.39	10.37	10.36	10.35	10.28	10.08	9.80	9.46	8.61	7.09	4.52	2.53	-.00	-.01
360	7.38	7.38	7.38	7.37	7.36	7.36	7.33	7.23	7.10	6.93	6.51	5.69	4.10	2.61	.11	-.01
390	5.77	5.76	5.76	5.76	5.76	5.75	5.73	5.68	5.59	5.49	5.23	4.70	3.61	2.49	.30	-.01
420	4.72	4.72	4.72	4.72	4.71	4.71	4.70	4.66	4.60	4.53	4.35	3.98	3.17	2.28	.42	-.01
450	3.97	3.97	3.97	3.97	3.97	3.97	3.96	3.93	3.88	3.83	3.69	3.41	2.78	2.05	.48	-.01
510	2.94	2.94	2.94	2.94	2.94	2.94	2.93	2.91	2.89	2.85	2.76	2.57	2.15	1.62	.48	-.01
600	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.94	1.93	1.91	1.85	1.73	1.46	1.12	.39	-.01
700	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.26	1.25	1.24	1.20	1.13	.95	.73	.27	-.00
800	.83	.83	.83	.83	.83	.83	.83	.82	.81	.81	.78	.73	.62	.48	.19	-.00
900	.54	.54	.54	.54	.54	.54	.54	.54	.53	.53	.51	.48	.40	.31	.12	-.00
1000	.35	.35	.35	.35	.35	.35	.35	.35	.35	.34	.33	.31	.26	.20	.08	-.00
2000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00
3000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00
4000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00
5000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00
6000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
10	30	-.01	300

102

TEMPERATURES IN RADIAL HEAT FLOW

LATENT HEAT DENSITY, 10 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
100	30.00	28.93	27.95	27.04	26.21	25.43	22.19	17.64	14.43	11.97	8.36	4.79	1.28	-.00	-.01	-.01
200	30.00	29.04	28.15	27.34	26.59	25.90	22.98	18.89	15.99	13.75	10.43	7.03	3.52	1.26	-.00	-.01
300	30.00	29.09	28.26	27.49	26.78	26.12	23.37	19.50	16.75	14.63	11.44	8.10	4.44	2.11	-.00	-.01
400	30.00	29.12	28.33	27.59	26.91	26.28	23.64	19.92	17.28	15.24	12.19	9.01	5.57	3.35	.45	-.01
500	30.00	29.16	28.39	27.68	27.02	26.41	23.86	20.28	17.73	15.76	12.81	9.71	6.28	3.97	1.14	-.01
600	30.00	29.17	28.42	27.73	27.08	26.49	23.99	20.48	17.99	16.06	13.15	10.09	6.66	4.30	1.57	-.01
700	30.00	29.19	28.44	27.76	27.12	26.53	24.07	20.61	18.15	16.25	13.38	10.37	7.01	4.73	1.93	-.00
800	30.00	29.20	28.47	27.80	27.18	26.60	24.19	20.78	18.37	16.51	13.70	10.75	7.47	5.25	2.46	-.00
900	30.00	29.22	28.50	27.84	27.23	26.66	24.30	20.96	18.60	16.76	14.01	11.11	7.87	5.67	2.81	-.00
1000	30.00	29.23	28.52	27.88	27.27	26.72	24.39	21.10	18.77	16.97	14.26	11.39	8.19	5.98	3.06	-.00
1100	8.68	8.68	8.68	8.68	8.67	8.67	8.65	8.60	8.53	8.44	8.19	7.70	6.63	5.42	3.09	.17
1200	6.11	6.11	6.11	6.10	6.10	6.10	6.09	6.07	6.03	5.99	5.87	5.62	5.05	4.34	2.72	.37
1300	4.66	4.66	4.66	4.66	4.66	4.66	4.65	4.64	4.61	4.59	4.51	4.35	3.96	3.47	2.27	.43
1400	3.67	3.67	3.67	3.67	3.67	3.67	3.66	3.65	3.63	3.61	3.56	3.44	3.16	2.80	1.91	.30
1500	2.94	2.94	2.94	2.94	2.94	2.94	2.94	2.93	2.92	2.90	2.86	2.78	2.57	2.31	1.67	.45
1600	2.42	2.42	2.42	2.42	2.42	2.42	2.41	2.41	2.40	2.39	2.36	2.30	2.15	1.96	1.48	.50
1700	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.02	2.02	2.01	1.99	1.94	1.83	1.68	1.32	.51
1800	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.73	1.73	1.72	1.71	1.67	1.58	1.47	1.18	.49
1900	1.51	1.51	1.51	1.51	1.51	1.51	1.51	1.51	1.50	1.50	1.48	1.45	1.39	1.29	1.05	.46
2000	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.31	1.30	1.28	1.22	1.14	.94	.43
3000	.42	.42	.42	.42	.42	.42	.42	.42	.42	.42	.41	.41	.39	.37	.31	.15
4000	.14	.14	.14	.14	.14	.14	.14	.14	.14	.14	.14	.13	.13	.12	.10	.05
5000	.05	.05	.05	.05	.05	.05	.05	.05	.04	.04	.04	.04	.04	.04	.03	.02
6000	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
10	30	-.01	1000

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 10 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
1	30.00	26.49	23.28	20.39	17.71	15.22	5.92	-2.48	-4.32	-4.89	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
2	30.00	27.11	24.47	22.08	19.88	17.82	9.31	-.54	-2.86	-4.33	-4.93	-5.00	-5.00	-5.00	-5.00	-5.00
3	30.00	27.46	25.15	23.03	21.08	19.25	11.85	1.59	-1.98	-3.58	-4.78	-4.99	-5.00	-5.00	-5.00	-5.00
4	30.00	27.58	25.37	23.34	21.46	19.71	12.53	4.29	-.58	-3.05	-4.56	-4.96	-5.00	-5.00	-5.00	-5.00
5	30.00	27.71	25.62	23.71	21.94	20.30	13.58	4.97	-.39	-2.32	-4.31	-4.92	-5.00	-5.00	-5.00	-5.00
6	30.00	27.85	25.88	24.08	22.42	20.87	14.52	5.53	-.18	-1.52	-4.00	-4.86	-4.99	-5.00	-5.00	-5.00
7	30.00	27.95	26.08	24.36	22.77	21.29	15.21	7.08	-.25	-1.68	-3.65	-4.78	-4.99	-5.00	-5.00	-5.00
8	30.00	28.02	26.22	24.56	23.03	21.60	15.71	7.71	1.33	-1.18	-3.36	-4.69	-4.98	-5.00	-5.00	-5.00
9	30.00	28.07	26.31	24.70	23.20	21.81	16.03	8.05	2.86	-.50	-3.13	-4.59	-4.97	-5.00	-5.00	-5.00
10	30.00	28.10	26.36	24.77	23.29	21.91	16.20	8.23	3.67	.54	-2.96	-4.49	-4.95	-5.00	-5.00	-5.00
11	18.14	17.84	17.56	17.06	16.59	16.15	13.51	7.89	3.87	.95	-2.79	-4.39	-4.94	-4.99	-5.00	-5.00
12	13.30	13.13	12.97	12.68	12.41	12.16	10.59	6.91	3.57	.88	-2.53	-4.29	-4.92	-4.99	-5.00	-5.00
13	10.45	10.33	10.22	10.02	9.84	9.67	8.58	5.94	3.15	.78	-2.30	-4.19	-4.90	-4.99	-5.00	-5.00
14	8.35	8.27	8.19	8.05	7.91	7.79	7.00	5.03	2.71	.67	-2.09	-4.08	-4.87	-4.99	-5.00	-5.00
15	6.87	6.81	6.75	6.64	6.54	6.44	5.83	4.27	2.32	.57	-1.95	-3.97	-4.85	-4.98	-5.00	-5.00
16	5.66	5.61	5.56	5.48	5.40	5.32	4.84	3.59	1.95	.48	-1.86	-3.87	-4.82	-4.98	-5.00	-5.00
17	4.74	4.70	4.66	4.59	4.52	4.46	4.06	3.02	1.65	.41	-1.80	-3.78	-4.80	-4.97	-5.00	-5.00
18	3.94	3.90	3.87	3.81	3.76	3.70	3.37	2.50	1.36	.33	-1.77	-3.70	-4.77	-4.97	-5.00	-5.00
19	3.26	3.23	3.21	3.16	3.11	3.07	2.78	2.04	1.10	.27	-1.77	-3.63	-4.74	-4.96	-5.00	-5.00
20	2.72	2.69	2.67	2.63	2.59	2.55	2.30	1.65	.89	.22	-1.78	-3.57	-4.71	-4.95	-5.00	-5.00
30	.25	.25	.25	.24	.24	.23	.20	.13	.00	-.67	-1.81	-3.25	-4.45	-4.86	-4.99	-5.00
40	.00	.00	.00	.00	.00	.00	.00	-.23	-.75	-1.21	-2.09	-3.16	-4.27	-4.76	-4.98	-5.00
50	.00	-.00	-.07	-.14	-.20	-.26	-.54	-.99	-1.38	-1.72	-2.36	-3.19	-4.16	-4.67	-4.96	-5.00
60	-1.84	-1.84	-1.84	-1.85	-1.86	-1.86	-1.90	-2.00	-2.14	-2.30	-2.68	-3.28	-4.10	-4.60	-4.93	-5.00
70	-2.48	-2.48	-2.48	-2.49	-2.49	-2.49	-2.51	-2.57	-2.66	-2.75	-2.99	-3.42	-4.09	-4.54	-4.91	-5.00
80	-2.88	-2.88	-2.88	-2.88	-2.89	-2.89	-2.90	-2.94	-3.00	-3.07	-3.24	-3.55	-4.10	-4.51	-4.89	-5.00
90	-3.16	-3.16	-3.17	-3.17	-3.17	-3.17	-3.18	-3.21	-3.25	-3.30	-3.43	-3.68	-4.12	-4.49	-4.87	-5.00
100	-3.38	-3.38	-3.38	-3.38	-3.38	-3.38	-3.39	-3.42	-3.45	-3.49	-3.59	-3.78	-4.15	-4.48	-4.85	-5.00
200	-4.24	-4.24	-4.24	-4.24	-4.24	-4.24	-4.25	-4.25	-4.26	-4.27	-4.29	-4.34	-4.44	-4.55	-4.77	-4.97
300	-4.51	-4.51	-4.51	-4.51	-4.51	-4.51	-4.51	-4.51	-4.51	-4.52	-4.53	-4.55	-4.59	-4.65	-4.77	-4.94
400	-4.63	-4.63	-4.63	-4.63	-4.63	-4.63	-4.63	-4.63	-4.64	-4.64	-4.64	-4.65	-4.68	-4.72	-4.79	-4.93
500	-4.71	-4.71	-4.71	-4.71	-4.71	-4.71	-4.71	-4.71	-4.71	-4.71	-4.71	-4.72	-4.74	-4.76	-4.82	-4.92

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
10	30	-5.0	10

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 10 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
10	30.00	28.10	26.36	24.77	23.29	21.91	16.20	8.23	3.67	.54	-2.96	-4.49	-4.95	-5.00	-5.00	-5.00
20	30.00	28.38	26.91	25.55	24.30	23.13	18.27	11.53	6.96	2.87	-1.27	-3.30	-4.69	-4.95	-5.00	-5.00
30	30.00	28.47	27.07	25.78	24.59	23.48	18.87	12.41	7.95	4.81	.86	-2.53	-4.31	-4.84	-4.99	-5.00
33	14.06	13.96	13.87	13.69	13.53	13.38	12.43	10.05	7.36	4.90	.87	-2.21	-4.20	-4.80	-4.99	-5.00
36	9.62	9.56	9.52	9.43	9.35	9.27	8.78	7.50	5.88	4.15	.74	-1.92	-4.07	-4.75	-4.98	-5.00
39	7.13	7.10	7.07	7.01	6.96	6.91	6.59	5.75	4.65	3.35	.60	-1.72	-3.95	-4.70	-4.97	-5.00
42	5.43	5.41	5.39	5.35	5.31	5.28	5.05	4.45	3.64	2.65	.47	-1.62	-3.83	-4.65	-4.97	-5.00
45	4.19	4.18	4.16	4.13	4.10	4.08	3.91	3.45	2.82	2.06	.37	-1.59	-3.73	-4.59	-4.96	-5.00
51	2.49	2.48	2.47	2.45	2.44	2.42	2.31	2.01	1.60	1.14	.20	-1.64	-3.57	-4.49	-4.94	-5.00
60	.93	.93	.92	.91	.91	.90	.84	.70	.51	.32	.02	-1.77	-3.43	-4.35	-4.90	-5.00
70	.27	.27	.26	.26	.26	.26	.24	.20	.14	.08	-.52	-1.77	-3.33	-4.22	-4.86	-5.00
80	.05	.05	.05	.05	.05	.04	.04	.03	.01	.00	-.88	-1.87	-3.25	-4.12	-4.82	-5.00
90	.00	.00	.00	.00	.00	.00	.00	.00	-.04	-.42	-1.06	-2.02	-3.23	-4.05	-4.78	-5.00
100	.00	.00	.00	.00	.00	.00	.00	-.01	-.39	-.73	-1.36	-2.15	-3.23	-3.99	-4.74	-4.99
200	-3.16	-3.16	-3.16	-3.16	-3.16	-3.16	-3.17	-3.18	-3.20	-3.23	-3.29	-3.42	-3.70	-4.00	-4.51	-4.94
300	-3.85	-3.85	-3.85	-3.85	-3.85	-3.85	-3.86	-3.86	-3.87	-3.88	-3.90	-3.95	-4.07	-4.21	-4.50	-4.88
400	-4.16	-4.16	-4.16	-4.16	-4.16	-4.16	-4.17	-4.17	-4.17	-4.18	-4.19	-4.22	-4.28	-4.36	-4.55	-4.84
500	-4.34	-4.34	-4.34	-4.34	-4.34	-4.34	-4.34	-4.34	-4.35	-4.35	-4.36	-4.38	-4.42	-4.47	-4.59	-4.82
600	-4.46	-4.46	-4.46	-4.46	-4.46	-4.46	-4.46	-4.46	-4.46	-4.46	-4.47	-4.48	-4.51	-4.54	-4.63	-4.82
700	-4.54	-4.54	-4.54	-4.54	-4.54	-4.54	-4.54	-4.54	-4.54	-4.54	-4.55	-4.55	-4.57	-4.60	-4.67	-4.82
800	-4.60	-4.60	-4.60	-4.60	-4.60	-4.60	-4.60	-4.60	-4.60	-4.60	-4.60	-4.60	-4.61	-4.63	-4.65	-4.70	-4.82
900	-4.64	-4.64	-4.64	-4.64	-4.64	-4.64	-4.64	-4.64	-4.65	-4.65	-4.65	-4.65	-4.67	-4.68	-4.73	-4.83
1000	-4.68	-4.68	-4.68	-4.68	-4.68	-4.68	-4.68	-4.68	-4.68	-4.68	-4.69	-4.69	-4.70	-4.71	-4.75	-4.84

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
10	30	-5.0	30

TEMPERATURES IN RADIAL HEAT FLOW

LATENT HEAT DENSITY, 10 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
10	30.00	28.10	26.36	24.77	23.29	21.91	16.20	8.23	3.67	.54	-2.96	-4.49	-4.95	-5.00	-5.00	-5.00
20	30.00	28.38	26.91	25.55	24.30	23.13	18.27	11.53	6.96	2.87	-1.27	-3.30	-4.69	-4.95	-5.00	-5.00
30	30.00	28.47	27.07	25.78	24.59	23.48	18.87	12.41	7.95	4.81	.86	-2.53	-4.31	-4.84	-4.99	-5.00
40	30.00	28.57	27.27	26.07	24.96	23.93	19.63	13.63	9.47	6.21	1.11	-1.46	-3.89	-4.68	-4.97	-5.00
50	30.00	28.65	27.41	26.27	25.22	24.24	20.17	14.45	10.46	7.44	2.44	-1.29	-3.43	-4.48	-4.94	-5.00
60	30.00	28.68	27.48	26.38	25.36	24.40	20.43	14.85	10.91	7.88	3.47	-.50	-3.10	-4.27	-4.90	-5.00
70	30.00	28.70	27.51	26.41	25.40	24.45	20.52	14.98	11.06	8.04	3.86	.50	-2.87	-4.08	-4.85	-5.00
80	30.00	28.72	27.56	26.48	25.49	24.56	20.71	15.30	11.51	8.62	4.50	.58	-2.51	-3.89	-4.79	-5.00
90	30.00	28.76	27.62	26.58	25.62	24.72	20.97	15.71	12.02	9.20	5.04	.65	-2.12	-3.68	-4.73	-5.00
100	30.00	28.79	27.68	26.66	25.72	24.85	21.19	16.06	12.45	9.68	5.49	.71	-1.75	-3.45	-4.66	-4.99
110	10.74	10.71	10.69	10.64	10.60	10.56	10.29	9.58	8.62	7.55	4.94	.64	-1.42	-3.23	-4.58	-4.99
120	6.93	6.92	6.91	6.88	6.86	6.84	6.72	6.37	5.88	5.31	3.67	.47	-1.22	-3.02	-4.50	-4.98
130	4.83	4.82	4.82	4.80	4.79	4.78	4.70	4.48	4.17	3.79	2.67	.34	-1.18	-2.86	-4.42	-4.98
140	3.44	3.43	3.43	3.42	3.41	3.40	3.34	3.19	2.97	2.70	1.89	.24	-1.22	-2.76	-4.34	-4.97
150	2.42	2.42	2.42	2.41	2.40	2.40	2.35	2.24	2.07	1.86	1.28	.16	-1.32	-2.70	-4.27	-4.96
170	1.02	1.02	1.02	1.01	1.01	1.01	.98	.90	.80	.67	.38	.04	-1.56	-2.68	-4.14	-4.94
200	.16	.16	.16	.16	.16	.15	.15	.14	.12	.10	.05	-.43	-1.70	-2.70	-4.02	-4.91
300	.00	.00	.00	.00	.00	.00	-.06	-.36	-.58	-.77	-1.12	-1.58	-2.26	-2.86	-3.82	-4.77
400	-2.43	-2.43	-2.43	-2.43	-2.43	-2.43	-2.44	-2.45	-2.46	-2.49	-2.54	-2.65	-2.91	-3.21	-3.82	-4.66
500	-3.10	-3.10	-3.10	-3.10	-3.10	-3.11	-3.11	-3.11	-3.12	-3.13	-3.16	-3.22	-3.36	-3.53	-3.92	-4.59
600	-3.49	-3.49	-3.49	-3.49	-3.49	-3.49	-3.49	-3.49	-3.50	-3.50	-3.52	-3.56	-3.65	-3.76	-4.03	-4.55
700	-3.74	-3.74	-3.74	-3.74	-3.74	-3.74	-3.74	-3.74	-3.74	-3.75	-3.76	-3.79	-3.85	-3.93	-4.13	-4.54
800	-3.91	-3.91	-3.91	-3.91	-3.92	-3.92	-3.92	-3.92	-3.92	-3.92	-3.93	-3.95	-4.00	-4.06	-4.21	-4.55
900	-4.05	-4.05	-4.05	-4.05	-4.05	-4.05	-4.05	-4.05	-4.05	-4.06	-4.06	-4.08	-4.11	-4.16	-4.28	-4.56
1000	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.16	-4.16	-4.16	-4.17	-4.18	-4.21	-4.24	-4.34	-4.58
2000	-4.63	-4.63	-4.63	-4.63	-4.63	-4.63	-4.63	-4.63	-4.63	-4.63	-4.63	-4.63	-4.64	-4.65	-4.68	-4.76

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
10	30	-5.0	100

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 10 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
100	30.00	28.79	27.68	26.66	25.72	24.85	21.19	16.06	12.45	9.68	5.49	.71	-1.75	-3.45	-4.66	-4.99
200	30.00	28.90	27.90	26.98	26.12	25.33	22.01	17.35	14.06	11.52	7.76	3.95	-.11	-1.93	-3.89	-4.91
300	30.00	28.99	28.06	27.21	26.42	25.69	22.63	18.33	15.28	12.92	9.38	5.69	.87	-1.10	-3.09	-4.73
330	8.22	8.21	8.20	8.19	8.18	8.16	8.08	7.86	7.54	7.16	6.20	4.45	1.32	-.80	-2.93	-4.66
360	4.76	4.76	4.75	4.75	4.74	4.73	4.69	4.59	4.43	4.24	3.74	2.78	.94	-.66	-2.80	-4.59
390	2.89	2.88	2.88	2.88	2.87	2.87	2.85	2.78	2.69	2.58	2.28	1.70	.54	-.71	-2.69	-4.52
420	1.76	1.76	1.76	1.75	1.75	1.75	1.73	1.70	1.64	1.57	1.39	1.04	.24	-.83	-2.60	-4.45
450	1.07	1.07	1.07	1.07	1.07	1.07	1.06	1.03	1.00	.96	.85	.63	-.04	-.96	-2.52	-4.38
510	.26	.26	.26	.26	.26	.26	.25	.24	.22	.21	.16	.08	-.26	-1.21	-2.54	-4.26
600	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.00	.00	-.81	-1.44	-2.60	-4.12
700	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.20	-.63	-1.26	-1.79	-2.70	-4.03
800	-.76	-.76	-.76	-.76	-.77	-.77	-.78	-.82	-.87	-.92	-1.06	-1.30	-1.71	-2.10	-2.83	-3.97
900	-1.90	-1.90	-1.90	-1.90	-1.90	-1.90	-1.91	-1.92	-1.93	-1.94	-1.98	-2.06	-2.24	-2.47	-2.99	-3.95
1000	-2.41	-2.41	-2.41	-2.41	-2.41	-2.41	-2.41	-2.42	-2.42	-2.43	-2.46	-2.51	-2.63	-2.78	-3.16	-3.95
2000	-3.99	-3.99	-3.99	-3.99	-3.99	-3.99	-3.99	-3.99	-3.99	-4.00	-4.00	-4.01	-4.03	-4.06	-4.14	-4.37
3000	-4.48	-4.48	-4.48	-4.48	-4.48	-4.48	-4.48	-4.48	-4.48	-4.48	-4.48	-4.49	-4.50	-4.51	-4.55	-4.66
4000	-4.73	-4.73	-4.73	-4.73	-4.73	-4.73	-4.73	-4.73	-4.73	-4.73	-4.73	-4.73	-4.74	-4.74	-4.76	-4.82

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
10	30	-5.0	300

TEMPERATURES IN RADIAL HEAT FLOW

LATENT HEAT DENSITY, 10 MJ/M^3

TAU \ R	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
100	30.00	28.79	27.68	26.66	25.72	24.85	21.19	16.06	12.45	9.68	5.49	.71	-1.75	-3.45	-4.66	-4.99
200	30.00	28.90	27.90	26.98	26.12	25.33	22.01	17.35	14.06	11.52	7.76	3.95	-.11	-1.93	-3.89	-4.91
300	30.00	28.99	28.06	27.21	26.42	25.69	22.63	18.33	15.28	12.92	9.38	5.69	.87	-1.10	-3.09	-4.73
400	30.00	29.00	28.09	27.26	26.48	25.76	22.76	18.52	15.52	13.19	9.68	5.99	2.34	.24	-2.65	-4.49
500	30.00	29.04	28.17	27.36	26.62	25.93	23.04	18.96	16.08	13.85	10.50	7.02	3.11	.32	-2.02	-4.26
600	30.00	29.07	28.23	27.45	26.73	26.06	23.27	19.34	16.55	14.39	11.15	7.75	3.62	.37	-1.43	-4.00
700	30.00	29.10	28.27	27.51	26.81	26.16	23.43	19.59	16.87	14.76	11.59	8.25	4.51	1.40	-1.34	-3.74
800	30.00	29.11	28.29	27.54	26.84	26.20	23.50	19.70	17.00	14.91	11.75	8.42	4.64	2.06	-.96	-3.52
900	30.00	29.11	28.29	27.55	26.85	26.21	23.52	19.72	17.03	14.95	11.80	8.47	4.68	2.34	-.39	-3.35
1000	30.00	29.12	28.31	27.57	26.88	26.24	23.57	19.81	17.15	15.08	11.97	8.71	5.07	2.72	-.28	-3.19
1100	5.72	5.71	5.71	5.71	5.71	5.70	5.68	5.63	5.55	5.44	5.18	4.64	3.48	2.15	-.22	-3.00
1200	2.96	2.95	2.95	2.95	2.95	2.95	2.94	2.91	2.88	2.83	2.71	2.45	1.87	1.16	-.21	-2.85
1300	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.47	1.45	1.42	1.34	1.19	.83	.47	-.30	-2.79
1400	.66	.66	.66	.66	.66	.66	.66	.65	.64	.62	.59	.52	.35	.19	-.61	-2.76
1500	.29	.29	.29	.29	.29	.28	.28	.28	.28	.27	.25	.22	.15	.06	-.84	-2.75
1600	.12	.12	.12	.12	.12	.12	.12	.12	.11	.11	.10	.08	.04	.00	-.94	-2.73
1700	.03	.03	.03	.03	.02	.02	.02	.02	.02	.02	.02	.01	.01	-.20	-1.22	-2.76
1800	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.46	-1.33	-2.81
1900	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.23	-.73	-1.51	-2.86
2000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.50	-.90	-1.66	-2.92
3000	-2.93	-2.93	-2.93	-2.93	-2.93	-2.93	-2.93	-2.93	-2.93	-2.93	-2.94	-2.96	-3.01	-3.07	-3.24	-3.71
4000	-3.93	-3.93	-3.93	-3.93	-3.93	-3.93	-3.93	-3.93	-3.94	-3.94	-3.94	-3.95	-3.97	-4.00	-4.08	-4.31
5000	-4.44	-4.44	-4.44	-4.44	-4.44	-4.44	-4.44	-4.44	-4.44	-4.44	-4.44	-4.45	-4.46	-4.47	-4.52	-4.64
6000	-4.70	-4.70	-4.70	-4.70	-4.70	-4.70	-4.70	-4.70	-4.70	-4.70	-4.70	-4.71	-4.71	-4.72	-4.74	-4.81

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
10	30	-5.0	1000

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 10 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
1	30.00	26.02	22.39	18.74	15.36	12.21	-.23	-6.46	-9.11	-9.86	-9.99	-10.00	-10.00	-10.00	-10.00	-10.00
2	30.00	26.66	23.60	20.82	18.25	15.85	7.68	-2.58	-7.33	-9.09	-9.91	-10.00	-10.00	-10.00	-10.00	-10.00
3	30.00	27.09	24.44	22.02	19.78	17.70	9.21	-1.43	-5.70	-8.19	-9.71	-9.98	-10.00	-10.00	-10.00	-10.00
4	30.00	27.35	24.93	22.72	20.68	18.77	10.09	-.47	-4.16	-7.15	-9.40	-9.94	-10.00	-10.00	-10.00	-10.00
5	30.00	27.51	25.23	23.15	21.23	19.43	12.07	-.39	-3.77	-6.24	-9.04	-9.89	-10.00	-10.00	-10.00	-10.00
6	30.00	27.58	25.37	23.35	21.47	19.72	12.46	3.41	-2.18	-5.60	-8.64	-9.80	-9.99	-10.00	-10.00	-10.00
7	30.00	27.61	25.43	23.43	21.58	19.86	12.76	4.43	-.94	-5.10	-8.28	-9.70	-9.98	-10.00	-10.00	-10.00
8	30.00	27.71	25.61	23.69	21.91	20.26	13.46	4.87	-.78	-4.46	-7.93	-9.59	-9.97	-10.00	-10.00	-10.00
9	30.00	27.79	25.78	23.93	22.22	20.63	14.07	5.24	-.62	-3.80	-7.56	-9.46	-9.96	-10.00	-10.00	-10.00
10	30.00	27.86	25.91	24.12	22.46	20.91	14.53	5.52	-.48	-3.22	-7.21	-9.33	-9.94	-10.00	-10.00	-10.00
11	16.82	16.49	16.19	15.64	15.13	14.66	11.81	4.98	-.35	-2.69	-6.84	-9.18	-9.92	-9.99	-10.00	-10.00
12	11.61	11.42	11.25	10.94	10.65	10.38	8.69	3.79	-.28	-2.36	-6.49	-9.03	-9.89	-9.99	-10.00	-10.00
13	8.52	8.40	8.28	8.06	7.86	7.68	6.49	2.86	-.28	-2.29	-6.22	-8.88	-9.86	-9.99	-10.00	-10.00
14	6.22	6.12	6.04	5.88	5.73	5.59	4.71	2.06	-.32	-2.38	-6.01	-8.73	-9.83	-9.98	-10.00	-10.00
15	4.55	4.48	4.41	4.29	4.17	4.06	3.36	1.45	-.38	-2.55	-5.87	-8.59	-9.80	-9.98	-10.00	-10.00
16	3.16	3.10	3.05	2.95	2.86	2.77	2.20	.91	-.45	-2.77	-5.78	-8.46	-9.76	-9.97	-10.00	-10.00
17	2.09	2.04	1.99	1.91	1.84	1.77	1.32	.49	-.72	-2.97	-5.74	-8.35	-9.72	-9.96	-10.00	-10.00
18	1.26	1.23	1.20	1.15	1.10	1.06	.79	.21	-1.26	-3.08	-5.72	-8.24	-9.68	-9.96	-10.00	-10.00
19	.75	.74	.72	.69	.66	.63	.47	.00	-1.67	-3.12	-5.70	-8.15	-9.64	-9.95	-10.00	-10.00
20	.46	.44	.43	.40	.38	.35	.20	-.32	-1.77	-3.18	-5.67	-8.08	-9.60	-9.94	-10.00	-10.00
30	-2.93	-2.95	-2.97	-3.00	-3.02	-3.05	-3.21	-3.62	-4.17	-4.77	-6.03	-7.69	-9.26	-9.81	-9.99	-10.00
40	-5.22	-5.23	-5.23	-5.25	-5.26	-5.27	-5.33	-5.51	-5.75	-6.03	-6.70	-7.75	-9.06	-9.68	-9.97	-10.00
50	-6.34	-6.35	-6.35	-6.36	-6.36	-6.37	-6.40	-6.51	-6.65	-6.82	-7.23	-7.94	-8.97	-9.57	-9.94	-10.00
60	-7.03	-7.03	-7.03	-7.04	-7.04	-7.04	-7.07	-7.14	-7.23	-7.34	-7.62	-8.13	-8.95	-9.50	-9.91	-10.00
70	-7.49	-7.50	-7.50	-7.50	-7.50	-7.51	-7.52	-7.57	-7.64	-7.72	-7.92	-8.30	-8.96	-9.45	-9.89	-10.00
80	-7.83	-7.83	-7.83	-7.84	-7.84	-7.84	-7.85	-7.89	-7.94	-8.00	-8.16	-8.45	-8.99	-9.42	-9.86	-10.00
90	-8.09	-8.09	-8.09	-8.09	-8.10	-8.10	-8.11	-8.13	-8.17	-8.22	-8.34	-8.58	-9.02	-9.41	-9.84	-10.00
100	-8.29	-8.29	-8.29	-8.30	-8.30	-8.30	-8.31	-8.33	-8.36	-8.40	-8.50	-8.69	-9.06	-9.40	-9.82	-9.99
200	-9.17	-9.17	-9.17	-9.17	-9.17	-9.17	-9.17	-9.18	-9.19	-9.20	-9.22	-9.27	-9.38	-9.50	-9.74	-9.96
300	-9.45	-9.45	-9.45	-9.45	-9.45	-9.45	-9.45	-9.46	-9.46	-9.46	-9.47	-9.50	-9.55	-9.61	-9.75	-9.93
400	-9.59	-9.59	-9.59	-9.59	-9.59	-9.59	-9.59	-9.59	-9.60	-9.60	-9.60	-9.62	-9.65	-9.68	-9.77	-9.92
500	-9.67	-9.67	-9.67	-9.67	-9.67	-9.67	-9.67	-9.68	-9.68	-9.68	-9.68	-9.69	-9.71	-9.73	-9.79	-9.91

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
10	30	-10.0	10

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 10 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
10	30.00	27.86	25.91	24.12	22.46	20.91	14.53	5.52	-.48	-3.22	-7.21	-9.33	-9.94	-10.00	-10.00	-10.00
20	30.00	28.13	26.42	24.84	23.39	22.03	16.38	8.44	4.00	.98	-4.66	-7.83	-9.58	-9.94	-10.00	-10.00
30	30.00	28.31	26.77	25.35	24.03	22.81	17.72	10.63	5.44	1.34	-2.64	-6.55	-9.08	-9.79	-9.99	-10.00
33	12.45	12.33	12.23	12.04	11.86	11.70	10.64	8.01	4.40	1.08	-2.20	-6.17	-8.91	-9.73	-9.98	-10.00
36	7.50	7.45	7.39	7.30	7.20	7.12	6.57	5.12	2.84	.70	-2.13	-5.87	-8.74	-9.66	-9.97	-10.00
39	4.68	4.65	4.61	4.55	4.49	4.43	4.07	3.10	1.71	.42	-2.34	-5.68	-8.58	-9.60	-9.97	-10.00
42	2.72	2.70	2.67	2.62	2.58	2.54	2.28	1.57	.83	.20	-2.67	-5.60	-8.44	-9.53	-9.96	-10.00
45	1.36	1.34	1.32	1.30	1.27	1.25	1.09	.70	.30	-.18	-2.89	-5.57	-8.31	-9.45	-9.94	-10.00
51	.22	.22	.21	.21	.20	.19	.14	.05	-.45	-1.49	-3.18	-5.54	-8.11	-9.31	-9.92	-10.00
60	.00	.00	.00	.00	.00	.00	-.39	-1.19	-1.91	-2.58	-3.68	-5.68	-7.91	-9.13	-9.87	-10.00
70	-2.78	-2.79	-2.79	-2.81	-2.82	-2.84	-2.92	-3.14	-3.44	-3.79	-4.62	-5.94	-7.81	-8.97	-9.82	-10.00
80	-4.18	-4.18	-4.19	-4.19	-4.20	-4.21	-4.26	-4.39	-4.57	-4.78	-5.32	-6.26	-7.79	-8.85	-9.76	-10.00
90	-5.07	-5.07	-5.07	-5.08	-5.09	-5.09	-5.12	-5.21	-5.34	-5.49	-5.88	-6.59	-7.82	-8.78	-9.71	-9.99
100	-5.71	-5.71	-5.71	-5.72	-5.72	-5.72	-5.75	-5.81	-5.91	-6.02	-6.32	-6.87	-7.89	-8.74	-9.66	-9.99
200	-8.09	-8.09	-8.09	-8.09	-8.09	-8.09	-8.10	-8.11	-8.13	-8.15	-8.21	-8.33	-8.60	-8.90	-9.44	-9.93
300	-8.77	-8.77	-8.77	-8.77	-8.77	-8.77	-8.77	-8.77	-8.78	-8.79	-8.82	-8.87	-8.99	-9.13	-9.44	-9.86
400	-9.09	-9.09	-9.09	-9.09	-9.09	-9.09	-9.09	-9.09	-9.10	-9.10	-9.12	-9.15	-9.21	-9.30	-9.49	-9.82
500	-9.28	-9.28	-9.28	-9.28	-9.28	-9.28	-9.28	-9.28	-9.28	-9.29	-9.29	-9.31	-9.36	-9.41	-9.55	-9.80
600	-9.40	-9.40	-9.40	-9.40	-9.40	-9.40	-9.40	-9.40	-9.40	-9.41	-9.41	-9.43	-9.46	-9.50	-9.59	-9.79
700	-9.49	-9.49	-9.49	-9.49	-9.49	-9.49	-9.49	-9.49	-9.49	-9.49	-9.50	-9.51	-9.53	-9.56	-9.63	-9.80
800	-9.55	-9.55	-9.55	-9.55	-9.55	-9.55	-9.55	-9.56	-9.56	-9.56	-9.56	-9.57	-9.59	-9.61	-9.67	-9.80
900	-9.60	-9.60	-9.60	-9.60	-9.60	-9.60	-9.61	-9.61	-9.61	-9.61	-9.61	-9.62	-9.63	-9.65	-9.70	-9.81
1000	-9.65	-9.65	-9.65	-9.65	-9.65	-9.65	-9.65	-9.65	-9.65	-9.65	-9.65	-9.65	-9.67	-9.68	-9.72	-9.82

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
10	30	-10.0	30

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 10 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
10	30.00	27.86	25.91	24.12	22.46	20.91	14.53	5.52	-.48	-3.22	-7.21	-9.33	-9.94	-10.00	-10.00	-10.00
20	30.00	28.13	26.42	24.84	23.39	22.03	16.38	8.44	4.00	.98	-4.66	-7.83	-9.58	-9.94	-10.00	-10.00
30	30.00	28.31	26.77	25.35	24.03	22.81	17.72	10.63	5.44	1.34	-2.64	-6.55	-9.08	-9.79	-9.99	-10.00
40	30.00	28.41	26.96	25.63	24.40	23.25	18.47	11.77	6.18	1.52	-1.17	-5.38	-8.51	-9.57	-9.96	-10.00
50	30.00	28.46	27.06	25.77	24.57	23.46	18.81	12.28	7.66	4.17	-.67	-4.63	-7.96	-9.31	-9.92	-10.00
60	30.00	28.48	27.09	25.81	24.63	23.53	18.95	12.52	8.04	4.88	.87	-4.11	-7.52	-9.04	-9.87	-10.00
70	30.00	28.54	27.21	25.98	24.85	23.79	19.40	13.23	8.91	5.67	1.01	-3.37	-7.08	-8.77	-9.80	-10.00
80	30.00	28.58	27.29	26.10	25.00	23.98	19.71	13.72	9.51	6.21	1.11	-2.72	-6.63	-8.51	-9.72	-10.00
90	30.00	28.62	27.36	26.20	25.12	24.12	19.95	14.10	9.98	6.63	1.18	-2.16	-6.21	-8.23	-9.64	-9.99
100	30.00	28.65	27.41	26.27	25.22	24.24	20.15	14.41	10.36	6.98	1.24	-1.68	-5.82	-7.96	-9.55	-9.99
110	8.41	8.38	8.35	8.30	8.25	8.20	7.90	7.09	6.00	4.49	.80	-1.44	-5.47	-7.70	-9.45	-9.98
120	4.07	4.06	4.04	4.02	3.99	3.97	3.83	3.43	2.87	2.12	.38	-1.84	-5.28	-7.47	-9.35	-9.98
130	1.66	1.65	1.64	1.62	1.61	1.60	1.51	1.26	.93	.61	.08	-2.41	-5.26	-7.30	-9.24	-9.97
140	.48	.48	.48	.47	.47	.46	.44	.36	.26	.13	-.84	-2.64	-5.29	-7.18	-9.15	-9.96
150	.07	.07	.07	.07	.07	.06	.06	.04	.01	-.25	-1.46	-3.01	-5.33	-7.10	-9.06	-9.95
170	.00	.00	.00	.00	.00	.00	-.23	-.79	-1.25	-1.68	-2.50	-3.68	-5.52	-7.03	-8.91	-9.93
200	-3.42	-3.42	-3.42	-3.43	-3.43	-3.44	-3.46	-3.53	-3.64	-3.76	-4.09	-4.71	-5.91	-7.06	-8.74	-9.88
300	-6.37	-6.37	-6.37	-6.37	-6.37	-6.38	-6.38	-6.40	-6.43	-6.46	-6.55	-6.74	-7.15	-7.63	-8.59	-9.71
400	-7.45	-7.45	-7.45	-7.45	-7.45	-7.45	-7.46	-7.47	-7.48	-7.50	-7.54	-7.63	-7.84	-8.11	-8.69	-9.59
500	-8.03	-8.03	-8.03	-8.03	-8.03	-8.03	-8.04	-8.04	-8.05	-8.06	-8.08	-8.14	-8.27	-8.43	-8.82	-9.52
600	-8.40	-8.40	-8.40	-8.40	-8.40	-8.40	-8.40	-8.40	-8.41	-8.41	-8.43	-8.47	-8.55	-8.67	-8.94	-9.49
700	-8.65	-8.65	-8.65	-8.65	-8.65	-8.65	-8.65	-8.65	-8.65	-8.66	-8.67	-8.70	-8.76	-8.84	-9.05	-9.49
800	-8.83	-8.83	-8.83	-8.83	-8.83	-8.83	-8.83	-8.83	-8.83	-8.84	-8.85	-8.87	-8.91	-8.98	-9.14	-9.50
900	-8.97	-8.97	-8.97	-8.97	-8.97	-8.97	-8.97	-8.97	-8.97	-8.97	-8.98	-9.00	-9.03	-9.08	-9.21	-9.51
1000	-9.08	-9.08	-9.08	-9.08	-9.08	-9.08	-9.08	-9.08	-9.08	-9.08	-9.09	-9.10	-9.13	-9.17	-9.28	-9.53
2000	-9.59	-9.59	-9.59	-9.59	-9.59	-9.59	-9.59	-9.59	-9.59	-9.59	-9.59	-9.59	-9.60	-9.61	-9.65	-9.74

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
10	30	-10.0	100

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 10 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
100	30.00	28.65	27.41	26.27	25.22	24.24	20.15	14.41	10.36	6.98	1.24	-1.68	-5.82	-7.96	-9.55	-9.99
200	30.00	28.78	27.66	26.63	25.68	24.79	21.09	15.89	12.22	9.38	5.14	.66	-3.41	-5.96	-8.53	-9.88
300	30.00	28.86	27.81	26.85	25.96	25.13	21.68	16.82	13.38	10.72	6.73	1.30	-2.30	-4.45	-7.55	-9.64
330	5.48	5.48	5.47	5.45	5.44	5.42	5.34	5.09	4.75	4.33	3.06	.39	-1.65	-4.17	-7.28	-9.56
360	1.77	1.76	1.76	1.75	1.75	1.74	1.70	1.58	1.41	1.21	.73	.09	-2.35	-4.24	-7.08	-9.46
390	.28	.28	.28	.28	.28	.28	.27	.25	.21	.18	.06	-.93	-2.73	-4.42	-6.97	-9.37
420	.01	.01	.01	.01	.01	.01	.01	.00	.00	.00	-.64	-1.60	-3.20	-4.61	-6.90	-9.28
450	.00	.00	.00	.00	.00	.00	.00	-.30	-.67	-.99	-1.55	-2.36	-3.63	-4.83	-6.88	-9.19
510	-3.14	-3.15	-3.15	-3.15	-3.15	-3.15	-3.17	-3.20	-3.25	-3.31	-3.47	-3.80	-4.52	-5.33	-6.92	-9.04
600	-4.88	-4.88	-4.88	-4.89	-4.89	-4.89	-4.89	-4.91	-4.93	-4.96	-5.04	-5.21	-5.59	-6.07	-7.14	-8.88
700	-5.94	-5.94	-5.94	-5.94	-5.94	-5.94	-5.94	-5.95	-5.97	-5.99	-6.03	-6.14	-6.37	-6.68	-7.41	-8.80
800	-6.62	-6.62	-6.62	-6.62	-6.62	-6.62	-6.62	-6.63	-6.64	-6.65	-6.68	-6.75	-6.92	-7.13	-7.67	-8.77
900	-7.09	-7.09	-7.09	-7.09	-7.10	-7.10	-7.10	-7.10	-7.11	-7.12	-7.14	-7.19	-7.32	-7.48	-7.89	-8.79
1000	-7.45	-7.45	-7.45	-7.45	-7.45	-7.45	-7.46	-7.46	-7.46	-7.47	-7.49	-7.53	-7.62	-7.75	-8.07	-8.82
2000	-8.92	-8.92	-8.92	-8.92	-8.92	-8.92	-8.92	-8.92	-8.93	-8.93	-8.93	-8.94	-8.96	-9.00	-9.08	-9.32
3000	-9.44	-9.44	-9.44	-9.44	-9.44	-9.44	-9.44	-9.44	-9.44	-9.44	-9.45	-9.45	-9.46	-9.48	-9.52	-9.64
4000	-9.70	-9.70	-9.70	-9.71	-9.71	-9.71	-9.71	-9.71	-9.71	-9.71	-9.71	-9.71	-9.72	-9.72	-9.75	-9.81

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
10	30	-10.0	300

112

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 10 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
100	30.00	28.65	27.41	26.27	25.22	24.24	20.15	14.41	10.36	6.98	1.24	-1.68	-5.82	-7.96	-9.55	-9.99
200	30.00	28.78	27.66	26.63	25.68	24.79	21.09	15.89	12.22	9.38	5.14	.66	-3.41	-5.96	-8.53	-9.88
300	30.00	28.86	27.81	26.85	25.96	25.13	21.68	16.82	13.38	10.72	6.73	1.30	-2.30	-4.45	-7.55	-9.64
400	30.00	28.87	27.84	26.90	26.02	25.21	21.81	17.01	13.61	10.97	7.01	3.18	-.25	-3.78	-6.80	-9.34
500	30.00	28.92	27.94	27.04	26.20	25.42	22.17	17.60	14.36	11.85	8.09	4.17	-.16	-2.85	-6.16	-9.02
600	30.00	28.96	28.00	27.13	26.31	25.56	22.41	17.97	14.82	12.38	8.72	4.72	-.09	-2.11	-5.55	-8.70
700	30.00	28.98	28.05	27.19	26.39	25.66	22.57	18.23	15.15	12.77	9.18	5.13	-.04	-1.52	-5.02	-8.39
800	30.00	29.00	28.08	27.24	26.46	25.73	22.71	18.44	15.42	13.08	9.55	5.84	-.00	-1.72	-4.56	-8.09
900	30.00	29.00	28.10	27.26	26.49	25.77	22.76	18.53	15.52	13.19	9.68	5.96	1.58	-1.12	-4.27	-7.81
1000	30.00	29.01	28.10	27.26	26.49	25.77	22.76	18.53	15.53	13.20	9.69	5.96	2.20	-.01	-4.07	-7.57
1100	2.54	2.54	2.54	2.53	2.53	2.53	2.51	2.45	2.37	2.27	2.01	1.50	.59	-.52	-3.92	-7.36
1200	.36	.36	.36	.36	.36	.36	.36	.34	.32	.29	.22	.11	-.39	-1.77	-3.96	-7.19
1300	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.52	-1.51	-2.50	-4.28	-7.09
1400	.00	-.04	-.07	-.11	-.14	-.17	-.32	-.59	-.80	-.98	-1.30	-1.76	-2.49	-3.22	-4.63	-7.06
1500	-2.86	-2.86	-2.87	-2.87	-2.87	-2.87	-2.87	-2.89	-2.91	-2.94	-3.01	-3.17	-3.52	-3.97	-5.02	-7.09
1600	-3.87	-3.87	-3.87	-3.87	-3.87	-3.87	-3.87	-3.88	-3.90	-3.91	-3.96	-4.06	-4.31	-4.62	-5.42	-7.16
1700	-4.57	-4.57	-4.57	-4.57	-4.57	-4.57	-4.58	-4.58	-4.59	-4.61	-4.64	-4.72	-4.91	-5.15	-5.79	-7.27
1800	-5.12	-5.12	-5.12	-5.12	-5.12	-5.12	-5.12	-5.13	-5.14	-5.15	-5.18	-5.24	-5.39	-5.59	-6.11	-7.39
1900	-5.56	-5.56	-5.56	-5.56	-5.57	-5.57	-5.57	-5.57	-5.58	-5.59	-5.61	-5.66	-5.79	-5.96	-6.40	-7.52
2000	-5.94	-5.94	-5.94	-5.94	-5.94	-5.94	-5.94	-5.95	-5.95	-5.96	-5.98	-6.02	-6.13	-6.27	-6.66	-7.65
3000	-8.01	-8.01	-8.01	-8.01	-8.01	-8.01	-8.01	-8.02	-8.02	-8.02	-8.03	-8.05	-8.09	-8.14	-8.30	-8.73
4000	-8.96	-8.96	-8.96	-8.96	-8.96	-8.96	-8.96	-8.96	-8.96	-8.96	-8.96	-8.97	-8.99	-9.02	-9.10	-9.33
5000	-9.45	-9.45	-9.45	-9.45	-9.45	-9.45	-9.45	-9.45	-9.45	-9.45	-9.45	-9.46	-9.47	-9.48	-9.53	-9.64
6000	-9.71	-9.71	-9.71	-9.71	-9.71	-9.71	-9.71	-9.71	-9.71	-9.71	-9.71	-9.71	-9.72	-9.73	-9.75	-9.81

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
10	30	-10.0	1000

113

TEMPERATURES IN RADIAL HEAT FLOW

LATENT HEAT DENSITY, 100 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
1	10.00	8.12	6.40	3.94	1.66	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
2	10.00	8.16	6.49	4.97	3.57	2.27	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
3	10.00	8.16	6.49	5.32	4.24	3.23	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
4	10.00	8.56	7.24	6.14	5.13	4.18	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
5	10.00	8.84	7.79	6.83	5.95	5.12	.55	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
6	10.00	8.88	7.86	6.92	6.05	5.24	1.18	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
7	10.00	8.89	7.87	6.93	6.06	5.26	1.58	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
8	10.00	8.89	7.87	6.93	6.07	5.26	1.85	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01
9	10.00	8.89	7.87	6.93	6.07	5.26	2.06	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01
10	10.00	8.89	7.87	6.93	6.07	5.26	2.21	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01
11	4.73	4.55	4.39	4.00	3.64	3.31	1.63	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01
12	2.67	2.57	2.48	2.27	2.07	1.89	.96	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01
13	1.47	1.41	1.37	1.25	1.14	1.04	.53	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01
14	.81	.78	.75	.69	.63	.57	.30	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01
15	.46	.44	.43	.39	.36	.32	.17	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01
16	.25	.24	.23	.21	.20	.18	.09	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01
17	.14	.14	.13	.12	.11	.10	.05	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01
18	.08	.08	.07	.07	.06	.06	.03	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01
19	.04	.04	.04	.04	.03	.03	.02	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01
20	.02	.02	.02	.02	.02	.02	.01	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01
30	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01
40	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01
50	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01
60	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01
70	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01
80	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01
90	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01
100	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01
200	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01
300	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01
400	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01
500	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01
600	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01
700	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01
800	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01
900	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01
1000	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
100	10	-.01	10

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 100 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
10	10.00	8.89	7.87	6.93	6.07	5.26	2.21	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01
20	10.00	9.20	8.46	7.79	7.17	6.59	4.17	.08	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01
30	10.00	9.20	8.47	7.80	7.18	6.60	4.18	1.05	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01
33	3.51	3.45	3.40	3.27	3.15	3.03	2.27	.73	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01
36	1.62	1.60	1.57	1.51	1.46	1.41	1.06	.36	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01
39	.74	.73	.72	.69	.67	.65	.49	.17	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01
42	.34	.34	.33	.32	.31	.30	.22	.08	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01
45	.16	.16	.15	.15	.14	.14	.10	.04	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01
51	.03	.03	.03	.03	.03	.03	.02	.01	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01
60	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01
70	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01
80	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01
90	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01
100	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01
200	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01
300	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01
400	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01
500	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01
600	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01
700	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01
800	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01
900	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01
1000	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01
2000	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.00	-.00	-.01	-.01	-.01
3000	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.00	-.00	-.01	-.01	-.01

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
100	10	-.01	30

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 100 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
10	10.00	8.89	7.87	6.93	6.07	5.26	2.21	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01
20	10.00	9.20	8.46	7.79	7.17	6.59	4.17	.08	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01
30	10.00	9.20	8.47	7.80	7.18	6.60	4.18	1.05	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01
40	10.00	9.20	8.47	7.80	7.18	6.60	4.21	1.08	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01
50	10.00	9.36	8.78	8.25	7.75	7.29	5.38	2.72	.14	-.00	-.00	-.01	-.01	-.01	-.01	-.01
60	10.00	9.38	8.81	8.28	7.80	7.34	5.46	2.81	.63	-.00	-.00	-.01	-.01	-.01	-.01	-.01
70	10.00	9.38	8.81	8.28	7.80	7.35	5.46	2.81	.90	-.00	-.00	-.01	-.01	-.01	-.01	-.01
80	10.00	9.38	8.81	8.28	7.80	7.35	5.46	2.81	1.07	-.00	-.00	-.01	-.01	-.01	-.01	-.01
90	10.00	9.38	8.81	8.28	7.80	7.35	5.46	2.81	1.20	.04	-.00	-.01	-.01	-.01	-.01	-.01
100	10.00	9.38	8.81	8.28	7.80	7.35	5.46	2.81	1.29	.24	-.00	-.01	-.01	-.01	-.01	-.01
110	2.03	2.02	2.00	1.97	1.94	1.91	1.72	1.22	.70	.20	-.00	-.00	-.01	-.01	-.01	-.01
120	.89	.88	.88	.87	.86	.86	.80	.66	.47	.18	-.00	-.00	-.01	-.01	-.01	-.01
130	.47	.47	.47	.47	.46	.46	.43	.36	.26	.11	-.00	-.00	-.01	-.01	-.01	-.01
140	.26	.26	.26	.25	.25	.25	.24	.20	.14	.06	-.00	-.00	-.01	-.01	-.01	-.01
150	.14	.14	.14	.14	.14	.14	.13	.11	.08	.03	-.00	-.00	-.01	-.01	-.01	-.01
170	.04	.04	.04	.04	.04	.04	.04	.03	.02	.01	-.00	-.00	-.01	-.01	-.01	-.01
200	.01	.01	.01	.01	.01	.01	.01	.01	.00	.00	-.00	-.00	-.01	-.01	-.01	-.01
300	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01	-.01
400	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01	-.01
500	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01	-.01
600	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01	-.01
700	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01	-.01
800	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01	-.01
900	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01	-.01
1000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01	-.01
2000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.00	-.01	-.01
3000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.00	-.01	-.01
4000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.00	-.01	-.01
5000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.00	-.01	-.01

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
100	10	-.01	100

TEMPERATURES IN RADIAL HEAT FLOW

LATENT HEAT DENSITY, 100 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
100	10.00	9.38	8.81	8.28	7.80	7.35	5.46	2.81	1.29	.24	-.00	-.01	-.01	-.01	-.01	-.01
200	10.00	9.49	9.02	3.59	8.20	7.83	6.28	4.11	2.57	1.41	-.00	-.00	-.01	-.01	-.01	-.01
300	10.00	9.55	9.14	8.77	8.42	8.09	6.74	4.85	3.52	2.51	.79	-.00	-.00	-.01	-.01	-.01
330	2.11	2.10	2.10	2.09	2.08	2.07	2.01	1.84	1.59	1.31	.54	-.00	-.00	-.01	-.01	-.01
360	.84	.84	.84	.83	.83	.83	.80	.74	.64	.53	.23	-.00	-.00	-.01	-.01	-.01
390	.34	.34	.34	.34	.33	.33	.32	.30	.26	.21	.09	-.00	-.00	-.01	-.01	-.01
420	.14	.14	.14	.14	.13	.13	.13	.12	.10	.09	.04	-.00	-.00	-.01	-.01	-.01
450	.06	.05	.05	.05	.05	.05	.05	.05	.04	.03	.02	-.00	-.00	-.01	-.01	-.01
510	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.00	-.00	-.00	-.00	-.01	-.01
600	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01
700	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01
800	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01
900	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01
1000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01
2000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01
3000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01
4000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01
5000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01
6000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
100	10	-.01	300

TEMPERATURES IN RADIAL HEAT FLOW

LATENT HEAT DENSITY, 100 MJ/M^3

TAU \ R	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
100	10.00	9.38	8.81	8.28	7.80	7.35	5.46	2.81	1.29	.24	-.00	-.01	-.01	-.01	-.01	-.01
200	10.00	9.49	9.02	8.59	8.20	7.83	6.28	4.11	2.57	1.41	-.00	-.00	-.01	-.01	-.01	-.01
300	10.00	9.55	9.14	8.77	8.42	8.09	6.74	4.85	3.52	2.51	.79	-.00	-.00	-.01	-.01	-.01
400	10.00	9.57	9.17	8.81	8.47	8.16	6.85	5.01	3.70	2.69	1.11	-.00	-.00	-.01	-.01	-.01
500	10.00	9.57	9.17	8.81	8.47	8.16	6.85	5.01	3.70	2.69	1.21	-.00	-.00	-.01	-.01	-.01
600	10.00	9.57	9.17	8.81	8.47	8.16	6.85	5.01	3.70	2.69	1.27	.11	-.00	-.00	-.01	-.01
700	10.00	9.61	9.26	8.93	8.63	8.35	7.17	5.52	4.36	3.47	2.16	.53	-.00	-.00	-.01	-.01
800	10.00	9.62	9.28	8.96	8.67	8.40	7.26	5.66	4.52	3.64	2.32	.75	-.00	-.00	-.01	-.01
900	10.00	9.62	9.28	8.97	8.67	8.40	7.27	5.67	4.54	3.66	2.33	.85	-.00	-.00	-.01	-.01
1000	10.00	9.62	9.28	8.97	8.67	8.40	7.27	5.67	4.54	3.66	2.33	.92	-.00	-.00	-.01	-.01
1100	1.05	1.05	1.05	1.05	1.04	1.04	1.03	.98	.92	.84	.65	.31	-.00	-.00	-.01	-.01
1200	.23	.23	.23	.23	.23	.23	.22	.21	.20	.18	.14	.07	-.00	-.00	-.01	-.01
1300	.05	.05	.05	.05	.05	.05	.05	.05	.04	.04	.03	.01	-.00	-.00	-.01	-.01
1400	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.00	-.00	-.00	-.00	-.01
1500	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01
1600	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01
1700	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01
1800	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01
1900	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01
2000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01
3000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01
4000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01
5000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01
6000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
100	10	-.01	1000

TEMPERATURES IN RADIAL HEAT FLOW
****

LATENT HEAT DENSITY, 100 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
1	10.00	7.17	4.58	2.20	-.00	-.19	-1.97	-4.27	-4.82	-4.97	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
2	10.00	8.16	6.49	4.23	2.13	.18	-1.29	-3.29	-4.32	-4.79	-4.98	-5.00	-5.00	-5.00	-5.00	-5.00
3	10.00	8.16	6.49	4.83	3.30	1.87	-.94	-2.86	-3.96	-4.55	-4.93	-5.00	-5.00	-5.00	-5.00	-5.00
4	10.00	8.16	6.49	5.17	3.95	2.81	-.65	-2.60	-3.68	-4.33	-4.85	-4.99	-5.00	-5.00	-5.00	-5.00
5	10.00	8.16	6.49	5.36	4.32	3.35	-.33	-2.43	-3.48	-4.16	-4.77	-4.97	-5.00	-5.00	-5.00	-5.00
6	10.00	8.48	7.10	5.94	4.87	3.87	-.11	-2.15	-3.30	-4.00	-4.69	-4.95	-5.00	-5.00	-5.00	-5.00
7	10.00	8.73	7.56	6.33	5.19	4.12	-.00	-1.55	-2.98	-3.82	-4.60	-4.93	-5.00	-5.00	-5.00	-5.00
8	10.00	8.86	7.82	6.87	5.99	5.17	-.02	-1.47	-2.71	-3.61	-4.51	-4.90	-4.99	-5.00	-5.00	-5.00
9	10.00	8.88	7.86	6.92	6.06	5.25	.35	-1.33	-2.53	-3.43	-4.41	-4.87	-4.99	-5.00	-5.00	-5.00
10	10.00	8.89	7.87	6.93	6.06	5.26	.74	-1.24	-2.40	-3.29	-4.31	-4.84	-4.99	-5.00	-5.00	-5.00
11	4.73	4.55	4.39	4.00	3.64	3.31	.71	-1.17	-2.30	-3.17	-4.22	-4.80	-4.98	-5.00	-5.00	-5.00
12	2.67	2.57	2.48	2.27	2.07	1.89	.43	-1.12	-2.22	-3.08	-4.13	-4.76	-4.97	-5.00	-5.00	-5.00
13	1.47	1.41	1.37	1.25	1.14	1.04	.22	-1.09	-2.15	-2.99	-4.05	-4.72	-4.97	-5.00	-5.00	-5.00
14	.81	.78	.75	.69	.63	.57	.10	-1.07	-2.10	-2.92	-3.98	-4.68	-4.96	-5.00	-5.00	-5.00
15	.46	.44	.43	.39	.36	.32	.04	-1.05	-2.05	-2.86	-3.91	-4.65	-4.95	-4.99	-5.00	-5.00
16	.25	.24	.23	.21	.20	.18	.01	-1.03	-2.00	-2.80	-3.85	-4.61	-4.94	-4.99	-5.00	-5.00
17	.14	.14	.13	.12	.11	.10	-.01	-1.02	-1.96	-2.75	-3.80	-4.57	-4.93	-4.99	-5.00	-5.00
18	.08	.08	.07	.06	.05	.04	-.02	-.93	-1.93	-2.70	-3.74	-4.53	-4.92	-4.99	-5.00	-5.00
19	.02	.02	.02	.01	.01	.01	-.10	-1.23	-2.01	-2.69	-3.70	-4.50	-4.91	-4.99	-5.00	-5.00
20	.00	.00	.00	.00	.00	.00	-.15	-1.35	-2.09	-2.71	-3.66	-4.46	-4.90	-4.98	-5.00	-5.00
30	.00	.00	.00	.00	.00	.00	-.47	-1.44	-2.15	-2.70	-3.49	-4.23	-4.78	-4.95	-5.00	-5.00
40	.00	.00	.00	.00	-.14	-.32	-.91	-1.65	-2.21	-2.66	-3.37	-4.08	-4.68	-4.90	-4.99	-5.00
50	-.42	-.48	-.53	-.61	-.67	-.73	-1.08	-1.75	-2.28	-2.71	-3.34	-3.99	-4.59	-4.85	-4.98	-5.00
60	-2.70	-2.70	-2.71	-2.71	-2.72	-2.73	-2.76	-2.86	-2.99	-3.14	-3.48	-3.96	-4.52	-4.80	-4.97	-5.00
70	-3.28	-3.28	-3.28	-3.29	-3.29	-3.29	-3.31	-3.36	-3.43	-3.51	-3.70	-4.03	-4.49	-4.76	-4.96	-5.00
80	-3.60	-3.60	-3.61	-3.61	-3.61	-3.61	-3.62	-3.65	-3.70	-3.75	-3.88	-4.11	-4.48	-4.73	-4.95	-5.00
90	-3.82	-3.82	-3.82	-3.82	-3.82	-3.82	-3.83	-3.85	-3.88	-3.92	-4.01	-4.19	-4.49	-4.72	-4.93	-5.00
100	-3.97	-3.97	-3.97	-3.97	-3.98	-3.98	-3.98	-4.00	-4.02	-4.05	-4.12	-4.26	-4.50	-4.70	-4.92	-5.00
200	-4.55	-4.55	-4.55	-4.55	-4.55	-4.55	-4.55	-4.55	-4.56	-4.56	-4.58	-4.61	-4.67	-4.74	-4.87	-4.98
300	-4.71	-4.71	-4.71	-4.71	-4.71	-4.71	-4.71	-4.71	-4.71	-4.71	-4.72	-4.73	-4.76	-4.80	-4.87	-4.97

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
100	10	-5.0	10

119

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 100 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
10	10.00	8.89	7.87	6.93	6.06	5.26	.74	-1.24	-2.40	-3.29	-4.31	-4.84	-4.99	-5.00	-5.00	-5.00
20	10.00	8.89	7.87	6.93	6.07	5.26	2.35	-.73	-1.86	-2.62	-3.65	-4.46	-4.90	-4.98	-5.00	-5.00
30	10.00	9.15	8.38	7.67	7.02	6.41	3.93	-.26	-1.12	-1.88	-3.17	-4.15	-4.77	-4.95	-5.00	-5.00
33	3.40	3.34	3.29	3.16	3.04	2.93	2.20	-.21	-1.01	-1.73	-3.00	-4.05	-4.73	-4.93	-5.00	-5.00
36	1.57	1.54	1.52	1.46	1.41	1.36	1.03	-.22	-.96	-1.64	-2.87	-3.95	-4.69	-4.92	-4.99	-5.00
39	.57	.55	.53	.49	.45	.41	.22	-.35	-1.19	-1.77	-2.81	-3.86	-4.64	-4.90	-4.99	-5.00
42	.10	.09	.09	.08	.08	.07	.04	-.44	-1.32	-1.90	-2.82	-3.80	-4.60	-4.88	-4.99	-5.00
45	.02	.02	.02	.01	.01	.01	.01	-.50	-1.36	-1.94	-2.83	-3.75	-4.56	-4.86	-4.99	-5.00
51	.00	.00	.00	.00	.00	.00	.00	-.57	-1.37	-1.95	-2.81	-3.68	-4.49	-4.82	-4.98	-5.00
60	.00	.00	.00	.00	.00	.00	.00	-.63	-1.35	-1.92	-2.76	-3.60	-4.40	-4.76	-4.97	-5.00
70	.00	.00	.00	.00	.00	.00	.00	-.67	-1.32	-1.87	-2.69	-3.51	-4.31	-4.70	-4.95	-5.00
80	.00	.00	.00	.00	.00	.00	-.18	-1.04	-1.57	-2.00	-2.68	-3.45	-4.23	-4.65	-4.93	-5.00
90	.00	.00	.00	.00	.00	.00	-.35	-1.10	-1.65	-2.08	-2.73	-3.43	-4.18	-4.59	-4.91	-5.00
100	.00	.00	.00	.00	-.02	-.16	-.61	-1.19	-1.68	-2.09	-2.73	-3.41	-4.13	-4.55	-4.89	-5.00
200	-3.88	-3.88	-3.88	-3.88	-3.88	-3.88	-3.89	-3.90	-3.91	-3.93	-3.97	-4.06	-4.24	-4.44	-4.75	-4.97
300	-4.34	-4.34	-4.34	-4.34	-4.34	-4.34	-4.34	-4.34	-4.35	-4.35	-4.37	-4.40	-4.47	-4.56	-4.73	-4.94
400	-4.53	-4.53	-4.53	-4.53	-4.53	-4.53	-4.53	-4.53	-4.53	-4.53	-4.54	-4.56	-4.60	-4.64	-4.75	-4.92
500	-4.63	-4.63	-4.63	-4.63	-4.63	-4.63	-4.63	-4.63	-4.63	-4.64	-4.64	-4.65	-4.67	-4.70	-4.78	-4.91
600	-4.70	-4.70	-4.70	-4.70	-4.70	-4.70	-4.70	-4.70	-4.70	-4.70	-4.70	-4.71	-4.73	-4.75	-4.80	-4.90

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
100	10	-5.0	30

TEMPERATURES IN RADIAL HEAT FLOW

LATENT HEAT DENSITY, 100 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
10	10.00	8.89	7.87	6.93	6.06	5.26	.74	-1.24	-2.40	-3.29	-4.31	-4.84	-4.99	-5.00	-5.00	-5.00
20	10.00	8.89	7.87	6.93	6.07	5.26	2.35	-.73	-1.86	-2.62	-3.65	-4.46	-4.90	-4.98	-5.00	-5.00
30	10.00	9.15	8.38	7.67	7.02	6.41	3.93	-.26	-1.12	-1.88	-3.17	-4.15	-4.77	-4.95	-5.00	-5.00
40	10.00	9.20	8.47	7.80	7.18	6.60	4.18	-.05	-.86	-1.55	-2.75	-3.83	-4.63	-4.89	-4.99	-5.00
50	10.00	9.20	8.47	7.80	7.18	6.60	4.18	.54	-.71	-1.42	-2.53	-3.60	-4.48	-4.83	-4.98	-5.00
60	10.00	9.20	8.47	7.80	7.18	6.60	4.18	.97	-.57	-1.34	-2.39	-3.43	-4.35	-4.76	-4.97	-5.00
70	10.00	9.20	8.47	7.80	7.18	6.60	4.18	1.24	-.42	-1.28	-2.29	-3.30	-4.24	-4.68	-4.95	-5.00
80	10.00	9.20	8.47	7.80	7.18	6.60	4.19	1.42	-.22	-1.24	-2.21	-3.19	-4.14	-4.61	-4.93	-5.00
90	10.00	9.30	8.67	8.08	7.54	7.04	4.95	1.91	-.09	-.70	-1.94	-3.06	-4.05	-4.55	-4.91	-5.00
100	10.00	9.34	8.74	8.18	7.67	7.19	5.20	2.06	-.00	-.33	-1.64	-2.86	-3.94	-4.48	-4.88	-5.00
110	1.88	1.87	1.85	1.82	1.79	1.76	1.55	.70	-.04	-.42	-1.50	-2.69	-3.83	-4.41	-4.86	-5.00
120	.24	.24	.24	.23	.22	.21	.16	.06	-.20	-.95	-1.75	-2.68	-3.74	-4.35	-4.83	-4.99
130	.02	.02	.02	.02	.02	.02	.01	.00	-.30	-1.00	-1.82	-2.70	-3.69	-4.28	-4.81	-4.99
140	.00	.00	.00	.00	.00	.00	.00	.00	-.38	-1.01	-1.83	-2.69	-3.65	-4.23	-4.78	-4.99
150	.00	.00	.00	.00	.00	.00	.00	.00	-.44	-1.01	-1.82	-2.68	-3.61	-4.19	-4.75	-4.99
170	.00	.00	.00	.00	.00	.00	.00	.00	-.52	-1.00	-1.80	-2.63	-3.54	-4.11	-4.70	-4.98
200	.00	.00	.00	.00	.00	.00	.00	-.34	-.91	-1.29	-1.91	-2.61	-3.46	-4.02	-4.63	-4.97
300	-1.77	-1.78	-1.78	-1.78	-1.79	-1.79	-1.83	-1.91	-2.02	-2.14	-2.43	-2.85	-3.44	-3.88	-4.46	-4.91
400	-3.51	-3.51	-3.51	-3.52	-3.52	-3.52	-3.52	-3.53	-3.54	-3.55	-3.59	-3.67	-3.83	-4.03	-4.40	-4.85
500	-3.95	-3.95	-3.95	-3.95	-3.95	-3.95	-3.95	-3.96	-3.96	-3.97	-3.99	-4.02	-4.11	-4.21	-4.44	-4.81
600	-4.18	-4.18	-4.18	-4.18	-4.18	-4.18	-4.18	-4.19	-4.19	-4.19	-4.20	-4.23	-4.28	-4.34	-4.50	-4.78
700	-4.33	-4.33	-4.33	-4.33	-4.33	-4.33	-4.33	-4.33	-4.33	-4.34	-4.34	-4.36	-4.39	-4.44	-4.55	-4.77
800	-4.43	-4.43	-4.43	-4.43	-4.43	-4.43	-4.43	-4.43	-4.43	-4.43	-4.44	-4.45	-4.48	-4.51	-4.59	-4.77
900	-4.50	-4.50	-4.50	-4.50	-4.50	-4.50	-4.50	-4.50	-4.51	-4.51	-4.51	-4.52	-4.54	-4.56	-4.63	-4.78
1000	-4.56	-4.56	-4.56	-4.56	-4.56	-4.56	-4.56	-4.56	-4.56	-4.56	-4.57	-4.57	-4.59	-4.61	-4.66	-4.79

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
100	10	-5.0	100

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 100 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
100	10.00	9.34	8.74	8.18	7.67	7.19	5.20	2.06	-.00	-.33	-1.64	-2.86	-3.94	-4.48	-4.88	-5.00
200	10.00	9.38	8.81	8.28	7.80	7.35	5.46	2.81	1.11	-.08	-1.18	-2.17	-3.24	-3.91	-4.60	-4.97
300	10.00	9.46	8.96	8.51	8.09	7.70	6.07	3.77	1.96	.48	-.41	-1.59	-2.81	-3.55	-4.36	-4.91
330	.49	.49	.49	.48	.47	.46	.41	.27	.14	.03	-.89	-1.70	-2.72	-3.44	-4.28	-4.88
360	.01	.01	.01	.01	.01	.01	.01	.01	.00	.00	-.96	-1.78	-2.72	-3.39	-4.22	-4.86
390	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.10	-.96	-1.78	-2.71	-3.35	-4.16	-4.83
420	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.23	-.96	-1.77	-2.68	-3.31	-4.12	-4.81
450	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.32	-.95	-1.75	-2.66	-3.28	-4.07	-4.78
510	.00	.00	.00	.00	.00	.00	.00	.00	-.25	-.71	-1.28	-1.91	-2.66	-3.23	-4.00	-4.73
600	.00	.00	.00	.00	.00	.00	.00	-.29	-.73	-1.04	-1.52	-2.06	-2.73	-3.23	-3.93	-4.66
700	.00	.00	-.05	-.13	-.19	-.25	-.54	-.97	-1.27	-1.51	-1.89	-2.32	-2.86	-3.27	-3.89	-4.60
800	-2.89	-2.89	-2.89	-2.89	-2.89	-2.89	-2.89	-2.90	-2.92	-2.93	-2.97	-3.06	-3.25	-3.47	-3.91	-4.55
900	-3.39	-3.39	-3.39	-3.39	-3.39	-3.39	-3.39	-3.39	-3.40	-3.41	-3.43	-3.47	-3.57	-3.70	-4.00	-4.52
1000	-3.67	-3.67	-3.67	-3.67	-3.67	-3.67	-3.67	-3.67	-3.68	-3.68	-3.70	-3.72	-3.79	-3.88	-4.09	-4.51
2000	-4.51	-4.51	-4.51	-4.51	-4.51	-4.51	-4.51	-4.51	-4.51	-4.51	-4.51	-4.52	-4.53	-4.54	-4.58	-4.70
3000	-4.75	-4.75	-4.75	-4.75	-4.75	-4.75	-4.75	-4.75	-4.75	-4.75	-4.75	-4.75	-4.76	-4.76	-4.78	-4.84

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU$_o$
100	10	-5.0	300

122

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 100 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
100	10.00	9.34	8.74	8.18	7.67	7.19	5.20	2.06	-.00	-.33	-1.64	-2.86	-3.94	-4.48	-4.88	-5.00
200	10.00	9.38	8.81	8.28	7.80	7.35	5.46	2.81	1.11	-.08	-1.18	-2.17	-3.24	-3.91	-4.60	-4.97
300	10.00	9.46	8.96	8.51	8.09	7.70	6.07	3.77	1.96	.48	-.41	-1.59	-2.81	-3.55	-4.36	-4.91
400	10.00	9.49	9.02	8.59	8.20	7.83	6.28	4.11	2.57	1.14	-.43	-1.27	-2.43	-3.20	-4.12	-4.82
500	10.00	9.49	9.02	8.59	8.20	7.83	6.28	4.11	2.57	1.34	-.26	-1.18	-2.26	-2.99	-3.92	-4.73
600	10.00	9.49	9.02	8.59	8.20	7.83	6.28	4.11	2.57	1.44	-.06	-1.12	-2.15	-2.85	-3.77	-4.64
700	10.00	9.49	9.02	8.59	8.20	7.83	6.28	4.11	2.57	1.50	.22	-1.08	-2.06	-2.75	-3.65	-4.56
800	10.00	9.53	9.10	8.71	8.35	8.01	6.59	4.60	3.20	2.09	.37	-.70	-1.85	-2.60	-3.54	-4.48
900	10.00	9.55	9.13	8.75	8.40	8.07	6.69	4.76	3.39	2.27	.40	-.45	-1.62	-2.41	-3.41	-4.40
1000	10.00	9.55	9.15	8.77	8.42	8.10	6.75	4.85	3.51	2.47	.62	-.53	-1.46	-2.25	-3.28	-4.33
1100	.07	.07	.07	.07	.06	.06	.06	.05	.04	.02	.00	-.85	-1.66	-2.28	-3.20	-4.26
1200	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.08	-.90	-1.74	-2.33	-3.18	-4.20
1300	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.25	-.90	-1.74	-2.33	-3.16	-4.15
1400	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.47	-.98	-1.74	-2.32	-3.14	-4.11
1500	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.10	-.67	-1.25	-1.92	-2.42	-3.15	-4.08
1600	.00	.00	.00	.00	.00	.00	.00	.00	-.02	-.27	-.70	-1.29	-1.97	-2.46	-3.16	-4.06
1700	.00	.00	.00	.00	.00	.00	.00	.00	-.28	-.57	-1.03	-1.53	-2.10	-2.53	-3.18	-4.04
1800	.00	.00	.00	.00	.00	.00	.00	-.30	-.62	-.88	-1.28	-1.70	-2.22	-2.61	-3.21	-4.03
1900	-.51	-.52	-.54	-.55	-.57	-.58	-.67	-.88	-1.09	-1.28	-1.58	-1.93	-2.36	-2.71	-3.25	-4.03
2000	-2.44	-2.44	-2.44	-2.44	-2.44	-2.44	-2.44	-2.45	-2.46	-2.47	-2.51	-2.58	-2.73	-2.92	-3.33	-4.04
3000	-4.06	-4.06	-4.06	-4.06	-4.06	-4.06	-4.06	-4.06	-4.06	-4.06	-4.07	-4.07	-4.10	-4.12	-4.20	-4.41
4000	-4.51	-4.51	-4.51	-4.51	-4.51	-4.51	-4.51	-4.51	-4.51	-4.52	-4.52	-4.52	-4.53	-4.54	-4.58	-4.69
5000	-4.74	-4.74	-4.74	-4.74	-4.74	-4.74	-4.74	-4.74	-4.74	-4.74	-4.75	-4.75	-4.75	-4.76	-4.78	-4.83
6000	-4.86	-4.86	-4.86	-4.86	-4.86	-4.86	-4.86	-4.86	-4.86	-4.86	-4.87	-4.87	-4.87	-4.87	-4.88	-4.91

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
100	10	-5.0	1000

123

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 100 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
1	10.00	7.17	4.58	2.20	-.00	-1.40	-5.46	-8.66	-9.64	-9.94	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
2	10.00	7.17	4.58	2.20	-.00	-.14	-2.62	-7.02	-8.85	-9.63	-9.96	-10.00	-10.00	-10.00	-10.00	-10.00
3	10.00	8.16	6.48	3.64	1.00	-.30	-2.40	-5.93	-8.08	-9.20	-9.88	-9.99	-10.00	-10.00	-10.00	-10.00
4	10.00	8.16	6.49	4.31	2.30	.43	-1.98	-5.31	-7.48	-8.75	-9.74	-9.98	-10.00	-10.00	-10.00	-10.00
5	10.00	8.16	6.49	4.73	3.10	1.58	-1.66	-4.93	-7.06	-8.39	-9.58	-9.95	-10.00	-10.00	-10.00	-10.00
6	10.00	8.16	6.49	5.01	3.65	2.38	-1.35	-4.65	-6.71	-8.07	-9.41	-9.91	-10.00	-10.00	-10.00	-10.00
7	10.00	8.16	6.49	5.21	4.03	2.93	-1.01	-4.43	-6.44	-7.80	-9.24	-9.87	-9.99	-10.00	-10.00	-10.00
8	10.00	8.16	6.49	5.35	4.29	3.31	-.63	-4.27	-6.23	-7.58	-9.09	-9.82	-9.99	-10.00	-10.00	-10.00
9	10.00	8.28	6.71	5.61	4.60	3.66	-.27	-4.13	-6.04	-7.38	-8.94	-9.76	-9.98	-10.00	-10.00	-10.00
10	10.00	8.52	7.17	6.00	4.92	3.91	-.20	-3.78	-5.83	-7.21	-8.80	-9.71	-9.97	-10.00	-10.00	-10.00
11	3.27	3.05	2.86	2.39	1.96	1.56	-.20	-3.56	-5.58	-7.00	-8.67	-9.65	-9.96	-10.00	-10.00	-10.00
12	.87	.79	.71	.59	.48	.38	-.33	-3.67	-5.50	-6.65	-8.54	-9.59	-9.95	-10.00	-10.00	-10.00
13	.18	.16	.14	.12	.09	.07	-.58	-3.65	-5.42	-6.73	-8.42	-9.52	-9.94	-9.99	-10.00	-10.00
14	.04	.03	.03	.02	.02	.01	-.80	-3.61	-5.35	-6.63	-8.31	-9.46	-9.93	-9.99	-10.00	-10.00
15	.01	.01	.01	.00	.00	.00	-.96	-3.56	-5.28	-6.54	-8.21	-9.40	-9.91	-9.99	-10.00	-10.00
16	.00	.00	.00	.00	.00	.00	-1.09	-3.51	-5.20	-6.46	-8.12	-9.34	-9.90	-9.99	-10.00	-10.00
17	.00	.00	.00	.00	.00	.00	-1.19	-3.46	-5.14	-6.38	-8.04	-9.28	-9.88	-9.98	-10.00	-10.00
18	.00	.00	.00	.00	.00	.00	-1.27	-3.42	-5.07	-6.30	-7.96	-9.22	-9.86	-9.98	-10.00	-10.00
19	.00	.00	.00	.00	.00	-.21	-1.33	-3.38	-5.01	-6.23	-7.88	-9.17	-9.85	-9.98	-10.00	-10.00
20	.00	.00	.00	.00	-.12	-.52	-1.83	-3.55	-5.01	-6.17	-7.81	-9.12	-9.83	-9.97	-10.00	-10.00
30	-4.65	-4.67	-4.69	-4.73	-4.75	-4.78	-4.95	-5.37	-5.91	-6.46	-7.53	-8.72	-9.63	-9.91	-9.99	-10.00
40	-6.74	-6.75	-6.76	-6.77	-6.77	-6.78	-6.84	-6.98	-7.17	-7.39	-7.89	-8.64	-9.48	-9.84	-9.98	-10.00
50	-7.60	-7.60	-7.61	-7.61	-7.62	-7.62	-7.65	-7.72	-7.83	-7.95	-8.24	-8.73	-9.40	-9.77	-9.97	-10.00
60	-8.09	-8.09	-8.10	-8.10	-8.10	-8.10	-8.12	-8.17	-8.23	-8.31	-8.51	-8.65	-9.38	-9.72	-9.95	-10.00
70	-8.41	-8.41	-8.42	-8.42	-8.42	-8.42	-8.43	-8.47	-8.51	-8.57	-8.70	-8.95	-9.38	-9.68	-9.94	-10.00
80	-8.64	-8.64	-8.64	-8.64	-8.65	-8.65	-8.66	-8.68	-8.71	-8.75	-8.86	-9.05	-9.39	-9.66	-9.92	-10.00
90	-8.81	-8.81	-8.81	-8.81	-8.81	-8.82	-8.82	-8.84	-8.87	-8.90	-8.98	-9.13	-9.41	-9.65	-9.91	-10.00
100	-8.94	-8.94	-8.94	-8.94	-8.95	-8.95	-8.95	-8.97	-8.99	-9.01	-9.07	-9.20	-9.43	-9.65	-9.90	-10.00
200	-9.50	-9.50	-9.50	-9.50	-9.50	-9.50	-9.50	-9.50	-9.51	-9.51	-9.53	-9.56	-9.63	-9.70	-9.84	-9.98
300	-9.67	-9.67	-9.67	-9.67	-9.67	-9.67	-9.67	-9.67	-9.67	-9.68	-9.68	-9.70	-9.73	-9.77	-9.85	-9.96

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
100	10	-10.0	10

7(2)

TEMPERATURES IN RADIAL HEAT FLOW

LATENT HEAT DENSITY, 100 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
10	10.00	8.52	7.17	6.00	4.92	3.91	-.20	-3.78	-5.83	-7.21	-8.80	-9.71	-9.97	-10.00	-10.00	-10.00
20	10.00	8.86	7.82	6.87	5.99	5.17	-.08	-2.08	-3.96	-5.51	-7.55	-9.06	-9.82	-9.97	-10.00	-10.00
30	10.00	8.89	7.87	6.93	6.07	5.26	1.54	-1.64	-3.40	-4.79	-6.75	-8.45	-9.59	-9.91	-9.99	-10.00
33	1.47	1.41	1.37	1.25	1.14	1.04	.32	-1.61	-3.30	-4.66	-6.59	-8.30	-9.52	-9.88	-9.99	-10.00
36	.26	.25	.24	.22	.20	.18	.02	-1.64	-3.22	-4.55	-6.45	-8.17	-9.44	-9.85	-9.99	-10.00
39	.02	.01	.01	.01	.01	.01	-.21	-2.09	-3.38	-4.51	-6.33	-8.05	-9.37	-9.82	-9.98	-10.00
42	.00	.00	.00	.00	.00	.00	-.56	-2.43	-3.68	-4.69	-6.29	-7.94	-9.30	-9.79	-9.98	-10.00
45	.00	.00	.00	.00	.00	.00	-.80	-2.51	-3.77	-4.76	-6.29	-7.86	-9.23	-9.76	-9.98	-10.00
51	.00	.00	.00	.00	-.25	-.55	-1.59	-2.91	-3.96	-4.84	-6.26	-7.74	-9.11	-9.69	-9.96	-10.00
60	-3.33	-3.35	-3.38	-3.41	-3.44	-3.47	-3.65	-4.11	-4.68	-5.25	-6.34	-7.64	-8.96	-9.59	-9.94	-10.00
70	-5.55	-5.55	-5.56	-5.57	-5.58	-5.59	-5.65	-5.80	-6.01	-6.25	-6.81	-7.70	-8.85	-9.49	-9.91	-10.00
80	-6.51	-6.51	-6.51	-6.52	-6.53	-6.53	-6.56	-6.65	-6.77	-6.91	-7.27	-7.88	-8.81	-9.41	-9.88	-10.00
90	-7.09	-7.09	-7.10	-7.10	-7.10	-7.11	-7.13	-7.19	-7.27	-7.37	-7.61	-8.06	-8.81	-9.36	-9.85	-10.00
100	-7.50	-7.50	-7.50	-7.51	-7.51	-7.51	-7.53	-7.57	-7.63	-7.70	-7.88	-8.23	-8.84	-9.33	-9.83	-10.00
200	-8.93	-8.93	-8.93	-8.94	-8.94	-8.94	-8.94	-8.95	-8.96	-8.97	-9.00	-9.07	-9.23	-9.39	-9.70	-9.96
300	-9.32	-9.32	-9.32	-9.32	-9.32	-9.32	-9.32	-9.32	-9.33	-9.33	-9.35	-9.38	-9.44	-9.53	-9.70	-9.93
400	-9.50	-9.50	-9.50	-9.50	-9.50	-9.50	-9.50	-9.50	-9.50	-9.51	-9.51	-9.53	-9.57	-9.62	-9.72	-9.90
500	-9.60	-9.60	-9.60	-9.60	-9.60	-9.60	-9.60	-9.61	-9.61	-9.61	-9.61	-9.62	-9.65	-9.68	-9.75	-9.69
600	-9.67	-9.67	-9.67	-9.67	-9.67	-9.67	-9.67	-9.67	-9.67	-9.68	-9.68	-9.69	-9.70	-9.72	-9.78	-9.89

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU$_0$
100	10	-10.0	30

TEMPERATURES IN RADIAL HEAT FLOW
****

LATENT HEAT DENSITY, 100 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
10	10.00	8.52	7.17	6.00	4.92	3.91	-.20	-3.78	-5.83	-7.21	-8.80	-9.71	-9.97	-10.00	-10.00	-10.00
20	10.00	8.86	7.82	6.87	5.99	5.17	-.08	-2.08	-3.96	-5.51	-7.55	-9.06	-9.82	-9.97	-10.00	-10.00
30	10.00	8.89	7.87	6.93	6.07	5.26	1.54	-1.64	-3.40	-4.79	-6.75	-8.45	-9.59	-9.91	-9.99	-10.00
40	10.00	8.89	7.87	6.93	6.07	5.26	2.27	-1.28	-3.13	-4.42	-6.28	-8.01	-9.34	-9.81	-9.98	-10.00
50	10.00	8.99	8.06	7.22	6.43	5.70	2.90	-.84	-2.86	-4.15	-5.96	-7.67	-9.12	-9.70	-9.97	-10.00
60	10.00	9.05	8.19	7.40	6.66	5.98	3.13	-.56	-2.33	-3.67	-5.57	-7.36	-8.91	-9.58	-9.94	-10.00
70	10.00	9.08	8.24	7.47	6.76	6.09	3.22	-.42	-2.02	-3.33	-5.24	-7.07	-8.71	-9.46	-9.91	-10.00
80	10.00	9.10	8.28	7.52	6.83	6.18	3.29	-.31	-1.78	-3.07	-4.97	-6.82	-8.52	-9.34	-9.88	-10.00
90	10.00	9.12	8.31	7.57	6.88	6.24	3.35	-.22	-1.58	-2.86	-4.74	-6.59	-8.34	-9.22	-9.84	-10.00
100	10.00	9.13	8.34	7.61	6.93	6.30	3.39	-.14	-1.41	-2.67	-4.54	-6.39	-8.18	-9.11	-9.80	-10.00
110	.08	.08	.07	.07	.06	.06	.03	-.82	-2.18	-3.13	-4.61	-6.26	-8.03	-8.99	-9.76	-9.99
120	.00	.00	.00	.00	.00	.00	.00	-1.08	-2.27	-3.23	-4.69	-6.24	-7.91	-8.89	-9.71	-9.99
130	.00	.00	.00	.00	.00	.00	-.27	-1.71	-2.63	-3.41	-4.71	-6.20	-7.83	-8.80	-9.67	-9.99
140	.00	.00	.00	.00	.00	-.03	-.73	-1.95	-2.93	-3.70	-4.89	-6.22	-7.76	-8.72	-9.62	-9.98
150	.00	-.09	-.26	-.42	-.57	-.70	-1.41	-2.53	-3.35	-4.00	-5.05	-6.27	-7.71	-8.65	-9.58	-9.98
170	-5.03	-5.03	-5.04	-5.04	-5.05	-5.06	-5.09	-5.19	-5.33	-5.49	-5.89	-6.59	-7.70	-8.55	-9.50	-9.97
200	-6.53	-6.53	-6.54	-6.54	-6.54	-6.54	-6.56	-6.60	-6.65	-6.72	-6.90	-7.24	-7.90	-8.53	-9.40	-9.95
300	-8.14	-8.14	-8.14	-8.14	-8.14	-8.14	-8.14	-8.15	-8.17	-8.19	-8.24	-8.33	-8.55	-8.81	-9.30	-9.86
400	-8.71	-8.71	-8.71	-8.71	-8.71	-8.71	-8.71	-8.72	-8.72	-8.73	-8.75	-8.80	-8.91	-9.05	-9.35	-9.80
500	-9.01	-9.01	-9.01	-9.01	-9.01	-9.01	-9.01	-9.01	-9.02	-9.02	-9.04	-9.06	-9.13	-9.21	-9.41	-9.76
600	-9.19	-9.19	-9.19	-9.19	-9.19	-9.19	-9.20	-9.20	-9.20	-9.20	-9.21	-9.23	-9.28	-9.33	-9.47	-9.75
700	-9.32	-9.32	-9.32	-9.32	-9.32	-9.32	-9.32	-9.32	-9.33	-9.33	-9.33	-9.35	-9.38	-9.42	-9.53	-9.75
800	-9.41	-9.41	-9.41	-9.41	-9.41	-9.41	-9.41	-9.42	-9.42	-9.42	-9.42	-9.43	-9.46	-9.49	-9.57	-9.75
900	-9.48	-9.48	-9.48	-9.48	-9.48	-9.48	-9.48	-9.49	-9.49	-9.49	-9.49	-9.50	-9.52	-9.54	-9.61	-9.76
1000	-9.54	-9.54	-9.54	-9.54	-9.54	-9.54	-9.54	-9.54	-9.54	-9.54	-9.55	-9.55	-9.57	-9.59	-9.64	-9.77

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
100	10	-10.0	100

126

TEMPERATUKES IN RADIAL HEAT FLOW

LATENT HEAT DENSITY, 100 MJ/M^3

TAU \ R	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
100	10.00	9.13	8.34	7.61	6.93	6.30	3.39	-.14	-1.41	-2.67	-4.54	-6.39	-8.18	-9.11	-9.80	-10.00
200	10.00	9.20	8.47	7.80	7.18	6.60	4.18	1.24	-.06	-2.00	-3.61	-5.28	-7.07	-8.19	-9.34	-9.95
300	10.00	9.28	8.63	8.02	7.46	6.94	4.77	1.79	-.23	-1.43	-3.02	-4.67	-6.46	-7.61	-8.93	-9.84
330	.01	.01	.00	.00	.00	.00	.00	.00	-.79	-1.75	-3.17	-4.66	-6.35	-7.48	-8.82	-9.80
360	.00	.00	.00	.00	.00	.00	.00	-.64	-1.60	-2.30	-3.40	-4.69	-6.27	-7.37	-8.72	-9.76
390	.00	.00	.00	.00	.00	.00	-.43	-1.49	-2.24	-2.84	-3.79	-4.90	-6.29	-7.31	-8.63	-9.72
420	-3.29	-3.29	-3.30	-3.31	-3.32	-3.33	-3.38	-3.52	-3.71	-3.92	-4.42	-5.21	-6.38	-7.30	-8.56	-9.68
450	-5.10	-5.10	-5.10	-5.11	-5.11	-5.11	-5.13	-5.17	-5.23	-5.31	-5.51	-5.88	-6.63	-7.35	-8.51	-9.64
510	-6.45	-6.45	-6.46	-6.46	-6.46	-6.46	-6.47	-6.48	-6.51	-6.54	-6.63	-6.80	-7.19	-7.63	-8.50	-9.56
600	-7.39	-7.39	-7.39	-7.39	-7.39	-7.39	-7.39	-7.40	-7.42	-7.43	-7.47	-7.56	-7.77	-8.02	-8.59	-9.48
700	-7.95	-7.95	-7.95	-7.95	-7.95	-7.95	-7.95	-7.96	-7.97	-7.98	-8.00	-8.06	-8.18	-8.34	-8.72	-9.42
800	-8.31	-8.31	-8.31	-8.31	-8.31	-8.31	-8.31	-8.31	-8.32	-8.32	-8.34	-8.38	-8.46	-8.57	-8.85	-9.41
900	-8.55	-8.55	-8.55	-8.55	-8.55	-8.55	-8.55	-8.56	-8.56	-8.57	-8.58	-8.60	-8.67	-8.75	-8.96	-9.41
1000	-8.74	-8.74	-8.74	-8.74	-8.74	-8.74	-8.74	-8.74	-8.74	-8.75	-8.76	-8.78	-8.82	-8.89	-9.05	-9.43
2000	-9.47	-9.47	-9.47	-9.47	-9.47	-9.47	-9.47	-9.47	-9.47	-9.47	-9.48	-9.48	-9.49	-9.51	-9.55	-9.67
3000	-9.73	-9.73	-9.73	-9.73	-9.73	-9.73	-9.73	-9.73	-9.73	-9.73	-9.73	-9.73	-9.74	-9.74	-9.76	-9.82

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
100	10	-10.0	300

TEMPERATURES IN RADIAL HEAT FLOW
****

LATENT HEAT DENSITY, 100 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
100	10.00	9.13	8.34	7.61	6.93	6.30	3.39	-.14	-1.41	-2.67	-4.54	-6.39	-8.18	-9.11	-9.60	-10.00
200	10.00	9.20	8.47	7.80	7.18	6.60	4.18	1.24	-.66	-2.00	-3.61	-5.28	-7.07	-8.19	-9.34	-9.95
300	10.00	9.28	8.63	8.02	7.46	6.94	4.77	1.79	-.23	-1.43	-3.02	-4.67	-6.46	-7.61	-8.93	-9.84
400	10.00	9.30	8.67	8.09	7.55	7.04	4.94	1.90	-.15	-1.07	-2.61	-4.23	-6.00	-7.17	-8.58	-9.71
500	10.00	9.32	8.70	8.13	7.60	7.11	5.07	1.97	-.10	-.80	-2.31	-3.90	-5.65	-6.82	-8.29	-9.57
600	10.00	9.33	8.73	8.17	7.65	7.17	5.16	2.03	-.05	-.59	-2.08	-3.64	-5.37	-6.54	-8.04	-9.42
700	10.00	9.35	8.75	8.20	7.69	7.22	5.24	2.08	-.01	-.42	-1.88	-3.42	-5.14	-6.31	-7.82	-9.29
800	10.00	9.38	8.81	8.28	7.80	7.35	5.46	2.81	.32	-.61	-1.76	-3.26	-4.95	-6.11	-7.63	-9.16
900	10.00	9.38	8.81	8.28	7.80	7.35	5.46	2.81	1.00	-.26	-1.71	-3.17	-4.81	-5.95	-7.46	-9.04
1000	10.00	9.38	8.81	8.28	7.80	7.35	5.46	2.81	1.29	.24	-1.67	-3.10	-4.70	-5.82	-7.32	-8.93
1100	.00	.00	.00	.00	.00	.00	.00	.00	-.24	-1.03	-1.95	-3.11	-4.62	-5.72	-7.20	-8.82
1200	.00	.00	.00	.00	.00	.00	-.23	-1.12	-1.69	-2.15	-2.90	-3.79	-4.93	-5.81	-7.14	-8.73
1300	-4.77	-4.77	-4.77	-4.77	-4.77	-4.77	-4.78	-4.80	-4.84	-4.88	-4.98	-5.19	-5.65	-6.17	-7.19	-8.66
1400	-5.97	-5.97	-5.97	-5.97	-5.97	-5.97	-5.98	-5.99	-6.00	-6.02	-6.07	-6.17	-6.41	-6.70	-7.39	-8.62
1500	-6.63	-6.63	-6.63	-6.63	-6.63	-6.63	-6.63	-6.64	-6.65	-6.66	-6.69	-6.76	-6.91	-7.11	-7.61	-8.62
1600	-7.08	-7.08	-7.08	-7.08	-7.08	-7.08	-7.08	-7.08	-7.09	-7.10	-7.12	-7.17	-7.28	-7.43	-7.81	-8.66
1700	-7.41	-7.41	-7.41	-7.41	-7.41	-7.41	-7.41	-7.41	-7.42	-7.43	-7.44	-7.48	-7.57	-7.69	-7.99	-8.71
1800	-7.67	-7.67	-7.67	-7.67	-7.67	-7.67	-7.67	-7.67	-7.68	-7.68	-7.70	-7.73	-7.80	-7.90	-8.15	-8.76
1900	-7.88	-7.88	-7.88	-7.88	-7.88	-7.88	-7.89	-7.89	-7.89	-7.90	-7.91	-7.93	-7.99	-8.07	-8.29	-8.82
2000	-8.06	-8.06	-8.06	-8.06	-8.06	-8.06	-8.07	-8.07	-8.07	-8.07	-8.08	-8.11	-8.16	-8.23	-8.41	-8.89
3000	-9.06	-9.06	-9.06	-9.06	-9.06	-9.06	-9.06	-9.06	-9.06	-9.06	-9.06	-9.07	-9.09	-9.12	-9.19	-9.40
4000	-9.50	-9.50	-9.50	-9.50	-9.50	-9.50	-9.50	-9.51	-9.51	-9.51	-9.51	-9.51	-9.52	-9.54	-9.57	-9.68
5000	-9.74	-9.74	-9.74	-9.74	-9.74	-9.74	-9.74	-9.74	-9.74	-9.74	-9.74	-9.74	-9.75	-9.75	-9.77	-9.83
6000	-9.86	-9.86	-9.86	-9.86	-9.86	-9.86	-9.86	-9.86	-9.86	-9.86	-9.86	-9.86	-9.87	-9.87	-9.88	-9.91

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
100	10	-10.0	1000

TEMPERATURES IN RADIAL HEAT FLOW

LATENT HEAT DENSITY, 100 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
1	30.00	24.48	19.45	15.70	12.24	9.02	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
2	30.00	26.07	22.48	19.39	16.52	13.86	1.54	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
3	30.00	26.58	23.46	20.62	17.98	15.53	5.23	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
4	30.00	26.65	23.59	20.78	18.17	15.75	6.91	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01	-.01
5	30.00	26.66	23.61	20.82	18.24	15.84	6.37	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01
6	30.00	27.02	24.30	21.87	19.62	17.52	9.53	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01
7	30.00	27.32	24.87	22.66	20.60	18.69	11.11	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01
8	30.00	27.46	25.14	23.03	21.07	19.25	11.84	.46	-.00	-.01	-.01	-.01	-.01	-.01	-.01	-.01
9	30.00	27.54	25.28	23.22	21.31	19.54	12.22	1.57	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01
10	30.00	27.57	25.35	23.31	21.42	19.67	12.39	2.36	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01
11	16.54	18.15	17.79	16.94	16.16	15.42	10.96	2.82	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01
12	13.81	13.57	13.34	12.83	12.29	11.83	8.75	2.67	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01
13	10.46	10.29	10.12	9.73	9.37	9.03	6.77	2.27	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01
14	8.00	7.87	7.75	7.45	7.18	6.93	5.21	1.84	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01
15	6.22	6.11	6.02	5.79	5.58	5.39	4.06	1.48	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01
16	4.77	4.69	4.62	4.45	4.29	4.14	3.12	1.17	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01
17	3.71	3.65	3.60	3.46	3.33	3.22	2.42	.92	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01
18	2.85	2.80	2.76	2.66	2.56	2.47	1.86	.72	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01
19	2.22	2.18	2.15	2.07	1.99	1.92	1.45	.56	.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01
20	1.71	1.68	1.66	1.60	1.54	1.49	1.16	.44	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01
30	.37	.36	.36	.36	.35	.34	.30	.20	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01
40	.11	.11	.11	.10	.10	.10	.09	.06	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01
50	.03	.03	.03	.03	.03	.03	.03	.02	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01
60	.01	.01	.01	.01	.01	.01	.01	.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01
70	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01
80	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01
90	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01	-.01
100	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01
200	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01
300	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01
400	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01
500	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01
600	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.00	-.01	-.01	-.01	-.01
700	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.00	-.00	-.01	-.01	-.01
800	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.00	-.00	-.01	-.01	-.01
900	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.00	-.00	-.01	-.01	-.01
1000	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.00	-.00	-.01	-.01	-.01

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
100	30	-.01	10

TEMPERATURES IN RADIAL HEAT FLOW

LATENT HEAT DENSITY, 100 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
10	30.00	27.57	25.35	23.31	21.42	19.67	12.39	2.36	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01
20	30.00	27.96	26.10	24.40	22.83	21.36	15.34	7.32	.66	-.00	-.00	-.01	-.01	-.01	-.01	-.01
30	30.00	28.12	26.40	24.83	23.36	22.00	16.34	8.37	3.21	-.00	-.00	-.01	-.01	-.01	-.01	-.01
33	14.74	14.60	14.47	14.15	13.86	13.59	11.74	7.16	3.19	.06	-.00	-.01	-.01	-.01	-.01	-.01
36	9.81	9.73	9.66	9.48	9.31	9.16	8.07	5.18	2.49	.33	-.00	-.01	-.01	-.01	-.01	-.01
39	6.71	6.66	6.61	6.49	6.38	6.28	5.56	3.60	1.80	.36	-.00	-.01	-.01	-.01	-.01	-.01
42	4.63	4.59	4.56	4.48	4.40	4.33	3.83	2.49	1.27	.30	-.00	-.01	-.01	-.01	-.01	-.01
45	3.22	3.19	3.17	3.12	3.06	3.02	2.68	1.82	.90	.20	-.00	-.01	-.01	-.01	-.01	-.01
51	1.76	1.75	1.74	1.72	1.70	1.68	1.56	1.22	.83	.30	-.00	-.01	-.01	-.01	-.01	-.01
60	.94	.94	.93	.92	.92	.91	.86	.71	.51	.21	-.00	-.00	-.01	-.01	-.01	-.01
70	.51	.51	.50	.50	.50	.49	.46	.39	.28	.12	-.00	-.00	-.01	-.01	-.01	-.01
80	.28	.28	.28	.27	.27	.27	.25	.21	.15	.06	-.00	-.00	-.01	-.01	-.01	-.01
90	.15	.15	.15	.15	.15	.15	.14	.12	.08	.04	-.00	-.00	-.01	-.01	-.01	-.01
100	.08	.08	.08	.08	.08	.08	.08	.06	.05	.02	-.00	-.00	-.01	-.01	-.01	-.01
200	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.01	-.01	-.01	-.01
300	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01	-.01
400	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01	-.01
500	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01	-.01
600	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01	-.01
700	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01	-.01
800	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01	-.01
900	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01	-.01
1000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01	-.01
2000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.00	-.01	-.01
3000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.00	-.01	-.01

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
100	30	-.01	30

TEMPERATURES IN RADIAL HEAT FLOW

LATENT HEAT DENSITY, 100 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
10	30.00	27.57	25.35	23.31	21.42	19.67	12.39	2.36	-.00	-.00	-.01	-.01	-.01	-.01	-.01	-.01
20	30.00	27.96	26.10	24.40	22.83	21.36	15.34	7.32	.66	-.00	-.00	-.01	-.01	-.01	-.01	-.01
30	30.00	28.12	26.40	24.83	23.36	22.00	16.34	8.37	3.21	-.00	-.00	-.01	-.01	-.01	-.01	-.01
40	30.00	28.13	26.43	24.86	23.41	22.06	16.44	8.67	3.75	.69	-.00	-.01	-.01	-.01	-.01	-.01
50	30.00	28.34	26.82	25.43	24.14	22.94	17.97	11.14	6.61	2.74	-.00	-.00	-.01	-.01	-.01	-.01
60	30.00	28.43	27.00	25.68	24.46	23.32	18.60	11.99	7.39	3.66	-.00	-.00	-.01	-.01	-.01	-.01
70	30.00	28.46	27.05	25.75	24.55	23.43	18.78	12.23	7.61	4.10	-.00	-.00	-.01	-.01	-.01	-.01
80	30.00	28.46	27.06	25.77	24.58	23.46	18.83	12.30	7.67	4.32	-.00	-.00	-.01	-.01	-.01	-.01
90	30.00	28.47	27.07	25.78	24.58	23.47	18.84	12.32	7.69	4.46	.54	-.00	-.01	-.01	-.01	-.01
100	30.00	28.47	27.08	25.79	24.61	23.50	18.90	12.46	8.04	4.86	.78	-.00	-.01	-.01	-.01	-.01
110	10.85	10.81	10.78	10.69	10.62	10.54	10.04	8.64	6.89	5.16	1.55	-.00	-.01	-.01	-.01	-.01
120	7.00	6.99	6.97	6.93	6.90	6.87	6.63	5.97	5.06	4.06	1.53	-.00	-.01	-.01	-.01	-.01
130	4.97	4.96	4.95	4.92	4.90	4.88	4.74	4.32	3.73	3.05	1.26	-.00	-.01	-.01	-.01	-.01
140	3.63	3.62	3.61	3.60	3.58	3.57	3.47	3.17	2.76	2.27	.98	-.00	-.00	-.01	-.01	-.01
150	2.67	2.66	2.66	2.65	2.64	2.63	2.55	2.34	2.03	1.68	.74	-.00	-.00	-.01	-.01	-.01
170	1.45	1.45	1.45	1.44	1.44	1.43	1.39	1.27	1.11	.91	.42	-.00	-.00	-.01	-.01	-.01
200	.59	.58	.58	.58	.58	.58	.56	.51	.45	.37	.17	-.00	-.00	-.01	-.01	-.01
300	.03	.03	.03	.03	.03	.03	.03	.02	.02	.02	.01	-.00	-.00	-.01	-.01	-.01
400	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.01	-.01	-.01
500	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01
600	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01
700	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01
800	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01
900	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01
1000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01
2000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01
3000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01
4000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01
5000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01	-.01

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
100	30	-.01	100

TEMPERATURES IN RADIAL HEAT FLOW

LATENT HEAT DENSITY, 100 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
100	30.00	28.47	27.08	25.79	24.61	23.50	18.90	12.46	8.04	4.86	.78	-.00	-.01	-.01	-.01	-.01
200	30.00	28.70	27.51	26.42	25.41	24.47	20.55	15.02	11.09	8.05	3.72	-.00	-.00	-.01	-.01	-.01
300	30.00	28.83	27.77	26.79	25.88	25.04	21.52	16.58	13.10	10.42	6.48	2.05	-.00	-.00	-.01	-.01
330	9.26	9.25	9.24	9.21	9.19	9.17	9.00	8.53	7.86	7.07	5.21	2.07	-.00	-.00	-.01	-.01
360	5.53	5.53	5.52	5.51	5.50	5.49	5.41	5.17	4.83	4.41	3.37	1.48	-.00	-.00	-.01	-.01
390	3.46	3.46	3.46	3.45	3.44	3.44	3.39	3.25	3.04	2.78	2.14	.97	-.00	-.00	-.01	-.01
420	2.19	2.18	2.18	2.18	2.17	2.17	2.14	2.05	1.92	1.76	1.35	.63	-.00	-.00	-.01	-.01
450	1.38	1.38	1.38	1.38	1.37	1.37	1.35	1.29	1.21	1.11	.85	.40	-.00	-.00	-.01	-.01
510	.55	.55	.55	.55	.55	.55	.54	.52	.48	.44	.34	.16	-.00	-.00	-.01	-.01
600	.14	.14	.14	.14	.14	.14	.14	.13	.12	.11	.09	.04	-.00	-.00	-.01	-.01
700	.03	.03	.03	.03	.03	.03	.03	.03	.03	.02	.02	.01	-.00	-.00	-.01	-.01
800	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.00	.00	-.00	-.00	-.01	-.01
900	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.01	-.01
1000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.01	-.01
2000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01
3000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01
4000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01
5000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01
6000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.00	-.00	-.01

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
100	30	-.01	300

TEMPERATURES IN RADIAL HEAT FLOW
****

LATENT HEAT DENSITY, 100 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
100	30.00	28.47	27.08	25.79	24.61	23.50	18.90	12.46	8.04	4.86	.78	-.00	-.01	-.01	-.01	-.01
200	30.00	28.70	27.51	26.42	25.41	24.47	20.55	15.02	11.09	8.05	3.72	-.00	-.00	-.01	-.01	-.01
300	30.00	28.83	27.77	26.79	25.88	25.04	21.52	16.58	13.10	10.42	6.48	2.05	-.00	-.00	-.01	-.01
400	30.00	28.87	27.84	26.89	26.01	25.19	21.79	16.98	13.58	10.93	6.96	2.86	-.00	-.00	-.01	-.01
500	30.00	28.87	27.84	26.90	26.02	25.21	21.80	17.01	13.61	10.97	6.99	3.12	-.00	-.00	-.01	-.01
600	30.00	28.93	27.95	27.06	26.22	25.45	22.22	17.69	14.49	12.03	8.42	4.84	.23	-.00	-.01	-.01
700	30.00	28.98	28.06	27.20	26.41	25.68	22.61	18.29	15.23	12.87	9.33	5.65	1.04	-.00	-.00	-.01
800	30.00	29.00	28.09	27.24	26.47	25.74	22.72	18.46	15.45	13.11	9.59	5.88	1.56	-.00	-.00	-.01
900	30.00	29.00	28.09	27.26	26.48	25.76	22.75	18.51	15.51	13.17	9.66	5.94	1.87	-.00	-.00	-.01
1000	30.00	29.00	28.10	27.26	26.49	25.77	22.76	18.53	15.52	13.19	9.68	5.96	2.08	-.00	-.00	-.01
1100	6.07	6.07	6.06	6.06	6.05	6.04	6.00	5.86	5.66	5.41	4.77	3.52	1.49	.01	-.00	-.01
1200	2.74	2.74	2.74	2.74	2.73	2.73	2.71	2.65	2.57	2.46	2.18	1.63	.72	.05	-.00	-.01
1300	1.26	1.26	1.26	1.26	1.26	1.26	1.25	1.22	1.18	1.13	1.00	.75	.33	.03	-.00	-.01
1400	.60	.60	.60	.60	.60	.59	.59	.58	.57	.55	.50	.40	.23	.03	-.00	-.01
1500	.35	.35	.35	.35	.35	.35	.34	.34	.33	.33	.30	.26	.17	.03	-.00	-.01
1600	.23	.23	.23	.22	.22	.22	.22	.22	.22	.21	.20	.17	.12	.02	-.00	-.01
1700	.15	.15	.15	.15	.15	.15	.15	.15	.15	.14	.13	.12	.08	.01	-.00	-.01
1800	.10	.10	.10	.10	.10	.10	.10	.10	.10	.10	.09	.08	.05	.01	-.00	-.01
1900	.07	.07	.07	.07	.07	.07	.07	.07	.07	.06	.06	.05	.04	.01	-.00	-.01
2000	.05	.05	.05	.05	.05	.05	.05	.05	.04	.04	.04	.04	.02	.00	-.00	-.01
3000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.01
4000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.01
5000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.01
6000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.01

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
100	30	-.01	1000

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 100 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
1	30.00	24.48	19.44	14.85	10.60	6.65	-1.31	-3.87	-4.70	-4.95	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
2	30.00	25.36	21.12	17.67	14.48	11.51	-.09	-2.75	-4.16	-4.72	-4.97	-5.00	-5.00	-5.00	-5.00	-5.00
3	30.00	26.46	23.22	20.31	17.62	15.12	2.09	-1.96	-3.48	-4.38	-4.91	-4.99	-5.00	-5.00	-5.00	-5.00
4	30.00	26.63	23.56	20.74	18.13	15.70	5.13	-1.53	-3.07	-4.03	-4.80	-4.98	-5.00	-5.00	-5.00	-5.00
5	30.00	26.65	23.60	20.79	18.19	15.77	6.54	-1.24	-2.82	-3.78	-4.68	-4.96	-5.00	-5.00	-5.00	-5.00
6	30.00	26.66	23.60	20.80	18.20	15.78	7.40	-.94	-2.63	-3.57	-4.55	-4.93	-5.00	-5.00	-5.00	-5.00
7	30.00	26.78	23.84	21.19	18.74	16.46	8.20	-.60	-2.31	-3.39	-4.43	-4.90	-4.99	-5.00	-5.00	-5.00
8	30.00	27.09	24.43	22.03	19.80	17.73	9.24	-.02	-1.58	-3.06	-4.31	-4.86	-4.99	-5.00	-5.00	-5.00
9	30.00	27.33	24.89	22.67	20.62	18.72	11.14	-.32	-1.65	-2.71	-4.16	-4.82	-4.99	-5.00	-5.00	-5.00
10	30.00	27.46	25.15	23.04	21.08	19.26	11.85	-.18	-1.46	-2.51	-4.01	-4.77	-4.98	-5.00	-5.00	-5.00
11	18.22	17.83	17.47	16.62	15.83	15.10	10.66	-.03	-1.32	-2.36	-3.87	-4.72	-4.97	-5.00	-5.00	-5.00
12	13.52	13.27	13.05	12.51	12.02	11.56	8.54	.47	-1.21	-2.25	-3.75	-4.66	-4.96	-5.00	-5.00	-5.00
13	10.22	10.05	9.89	9.51	9.15	8.82	6.61	.69	-1.13	-2.16	-3.64	-4.61	-4.95	-5.00	-5.00	-5.00
14	7.81	7.68	7.57	7.28	7.01	6.76	5.09	.68	-1.07	-2.09	-3.55	-4.55	-4.94	-4.99	-5.00	-5.00
15	6.07	5.97	5.88	5.66	5.45	5.26	3.96	.59	-1.02	-2.02	-3.46	-4.50	-4.93	-4.99	-5.00	-5.00
16	4.66	4.58	4.51	4.34	4.18	4.04	3.04	.48	-.99	-1.97	-3.39	-4.44	-4.92	-4.99	-5.00	-5.00
17	3.62	3.57	3.51	3.38	3.26	3.14	2.37	.37	-.96	-1.92	-3.32	-4.39	-4.90	-4.99	-5.00	-5.00
18	2.78	2.74	2.70	2.59	2.50	2.41	1.82	.28	-.94	-1.88	-3.26	-4.34	-4.89	-4.98	-5.00	-5.00
19	2.17	2.13	2.10	2.02	1.94	1.88	1.41	.21	-.93	-1.84	-3.20	-4.30	-4.87	-4.98	-5.00	-5.00
20	1.66	1.64	1.61	1.55	1.49	1.44	1.09	.15	-.91	-1.81	-3.15	-4.25	-4.86	-4.98	-5.00	-5.00
30	.12	.12	.12	.12	.11	.11	.08	-.06	-.87	-1.57	-2.79	-3.89	-4.69	-4.93	-5.00	-5.00
40	.00	.00	.00	.00	.00	.00	.00	-.36	-1.13	-1.67	-2.62	-3.65	-4.53	-4.86	-4.99	-5.00
50	.00	.00	.00	.00	.00	.00	.00	-.53	-1.30	-1.85	-2.68	-3.56	-4.41	-4.79	-4.97	-5.00
60	.00	.00	.00	.00	.00	.00	.00	-.61	-1.30	-1.84	-2.66	-3.49	-4.32	-4.72	-4.96	-5.00
70	.00	.00	.00	.00	.00	.00	.00	-.65	-1.28	-1.81	-2.61	-3.43	-4.24	-4.66	-4.94	-5.00
80	.00	.00	.00	.00	.00	.00	-.16	-1.00	-1.52	-1.94	-2.61	-3.37	-4.17	-4.60	-4.92	-5.00
90	.00	.00	.00	.00	.00	.00	-.33	-1.07	-1.61	-2.03	-2.67	-3.36	-4.12	-4.55	-4.90	-5.00
100	.00	.00	.00	.00	.00	-.08	-.43	-1.09	-1.63	-2.05	-2.68	-3.35	-4.08	-4.51	-4.88	-5.00
200	-3.83	-3.83	-3.83	-3.83	-3.83	-3.83	-3.83	-3.84	-3.86	-3.88	-3.92	-4.01	-4.21	-4.41	-4.73	-4.97
300	-4.30	-4.30	-4.30	-4.30	-4.30	-4.30	-4.30	-4.31	-4.31	-4.32	-4.33	-4.37	-4.44	-4.53	-4.71	-4.94
400	-4.50	-4.50	-4.50	-4.50	-4.50	-4.50	-4.50	-4.50	-4.50	-4.51	-4.52	-4.53	-4.57	-4.62	-4.74	-4.91
500	-4.61	-4.61	-4.61	-4.61	-4.61	-4.61	-4.61	-4.61	-4.61	-4.61	-4.62	-4.63	-4.66	-4.69	-4.76	-4.90
600	-4.68	-4.68	-4.68	-4.68	-4.68	-4.68	-4.68	-4.68	-4.68	-4.68	-4.69	-4.69	-4.71	-4.73	-4.79	-4.90

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
100	30	-5.0	10

134

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 100 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
10	30.00	27.46	25.15	23.04	21.08	19.26	11.85	-.18	-1.46	-2.51	-4.01	-4.77	-4.98	-5.00	-5.00	-5.00
20	30.00	27.60	25.41	23.40	21.53	19.79	12.55	4.27	-.33	-1.81	-3.15	-4.25	-4.86	-4.98	-5.00	-5.00
30	30.00	28.06	26.30	24.68	23.17	21.78	15.99	8.00	.49	-.81	-2.19	-3.72	-4.67	-4.93	-5.00	-5.00
33	14.48	14.34	14.21	13.90	13.61	13.33	11.50	6.98	1.23	-.68	-2.07	-3.57	-4.61	-4.90	-4.99	-5.00
36	9.61	9.53	9.46	9.28	9.12	8.97	7.90	5.06	1.22	-.58	-1.97	-3.45	-4.54	-4.88	-4.99	-5.00
39	6.57	6.52	6.47	6.36	6.25	6.15	5.44	3.53	.96	-.53	-1.90	-3.35	-4.48	-4.85	-4.99	-5.00
42	4.53	4.49	4.46	4.38	4.31	4.24	3.75	2.44	.69	-.49	-1.84	-3.26	-4.42	-4.83	-4.98	-5.00
45	3.14	3.12	3.10	3.04	2.99	2.94	2.61	1.70	.48	-.48	-1.78	-3.18	-4.36	-4.80	-4.98	-5.00
51	1.50	1.49	1.48	1.45	1.43	1.40	1.24	.81	.21	-.48	-1.70	-3.05	-4.25	-4.74	-4.97	-5.00
60	.50	.49	.49	.48	.47	.46	.41	.27	.05	-.52	-1.60	-2.90	-4.11	-4.65	-4.95	-5.00
70	.14	.14	.14	.14	.14	.14	.12	.08	.00	-.56	-1.52	-2.76	-3.97	-4.56	-4.93	-5.00
80	.04	.04	.04	.04	.04	.04	.04	.02	-.08	-.59	-1.46	-2.66	-3.85	-4.47	-4.90	-5.00
90	.00	.00	.00	.00	.00	.00	.00	.00	-.23	-.93	-1.72	-2.66	-3.77	-4.40	-4.87	-5.00
100	.00	.00	.00	.00	.00	.00	.00	.00	-.33	-1.00	-1.81	-2.70	-3.71	-4.33	-4.84	-5.00
200	.00	.00	.00	.00	.00	.00	.00	-.50	-.99	-1.40	-2.03	-2.70	-3.46	-3.98	-4.59	-4.96
300	-2.87	-2.87	-2.88	-2.88	-2.88	-2.88	-2.89	-2.91	-2.94	-2.97	-3.06	-3.24	-3.59	-3.92	-4.45	-4.90
400	-3.73	-3.73	-3.73	-3.73	-3.73	-3.73	-3.74	-3.74	-3.75	-3.76	-3.79	-3.84	-3.97	-4.12	-4.44	-4.85
500	-4.07	-4.07	-4.07	-4.07	-4.07	-4.07	-4.07	-4.08	-4.08	-4.08	-4.10	-4.13	-4.20	-4.28	-4.48	-4.81
600	-4.26	-4.26	-4.26	-4.26	-4.26	-4.26	-4.26	-4.26	-4.27	-4.27	-4.28	-4.30	-4.34	-4.40	-4.53	-4.79
700	-4.39	-4.39	-4.39	-4.39	-4.39	-4.39	-4.39	-4.39	-4.39	-4.39	-4.40	-4.41	-4.44	-4.48	-4.58	-4.78
800	-4.48	-4.48	-4.48	-4.48	-4.48	-4.48	-4.48	-4.48	-4.48	-4.48	-4.48	-4.49	-4.52	-4.55	-4.62	-4.79
900	-4.54	-4.54	-4.54	-4.54	-4.54	-4.54	-4.54	-4.54	-4.54	-4.54	-4.55	-4.56	-4.57	-4.60	-4.66	-4.79
1000	-4.59	-4.59	-4.59	-4.59	-4.59	-4.59	-4.59	-4.59	-4.59	-4.60	-4.60	-4.60	-4.62	-4.64	-4.68	-4.80

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
100	30	-5.0	30

135

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 100 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
10	30.00	27.46	25.15	23.04	21.08	19.26	11.85	-.18	-1.46	-2.51	-4.01	-4.77	-4.98	-5.00	-5.00	-5.00
20	30.00	27.60	25.41	23.40	21.53	19.79	12.55	4.27	-.33	-1.81	-3.15	-4.25	-4.86	-4.98	-5.00	-5.00
30	30.00	28.06	26.30	24.68	23.17	21.78	15.99	8.00	.49	-.81	-2.19	-3.72	-4.67	-4.93	-5.00	-5.00
40	30.00	28.13	26.41	24.84	23.38	22.03	16.37	8.41	2.74	-.38	-1.88	-3.32	-4.46	-4.85	-4.99	-5.00
50	30.00	28.13	26.42	24.85	23.39	22.04	16.39	8.43	3.67	.30	-1.71	-3.07	-4.27	-4.75	-4.97	-5.00
60	30.00	28.17	26.49	24.95	23.53	22.21	16.72	9.20	4.53	1.12	-1.29	-2.86	-4.10	-4.65	-4.95	-5.00
70	30.00	28.33	26.81	25.42	24.13	22.92	17.94	11.07	6.52	2.20	-.94	-2.35	-3.91	-4.55	-4.93	-5.00
80	30.00	28.43	26.99	25.67	24.45	23.31	18.58	11.96	7.37	3.13	-.74	-2.10	-3.70	-4.44	-4.90	-5.00
90	30.00	28.46	27.05	25.75	24.55	23.43	18.77	12.22	7.60	3.66	-.58	-1.95	-3.53	-4.33	-4.87	-5.00
100	30.00	28.46	27.06	25.77	24.58	23.46	18.83	12.30	7.67	3.96	-.43	-1.85	-3.39	-4.22	-4.83	-5.00
110	10.14	10.10	10.06	9.96	9.87	9.79	9.19	7.52	5.36	3.17	-.29	-1.77	-3.28	-4.12	-4.79	-4.99
120	5.40	5.38	5.36	5.32	5.27	5.23	4.94	4.10	2.98	1.81	-.22	-1.71	-3.18	-4.03	-4.75	-4.99
130	2.94	2.93	2.92	2.90	2.87	2.85	2.69	2.24	1.63	.99	-.21	-1.66	-3.10	-3.96	-4.71	-4.99
140	1.61	1.60	1.60	1.58	1.57	1.56	1.47	1.23	.89	.54	-.23	-1.62	-3.03	-3.88	-4.67	-4.99
150	.88	.88	.87	.86	.86	.85	.80	.67	.49	.29	-.26	-1.58	-2.97	-3.82	-4.64	-4.98
170	.26	.26	.26	.26	.26	.25	.24	.20	.14	.08	-.33	-1.51	-2.86	-3.70	-4.56	-4.97
200	.04	.04	.04	.04	.04	.04	.04	.03	.02	.01	-.41	-1.44	-2.73	-3.56	-4.46	-4.95
300	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.91	-1.70	-2.63	-3.30	-4.18	-4.87
400	.00	.00	.00	.00	.00	.00	.00	.00	-.00	-.35	-.93	-1.72	-2.61	-3.22	-4.03	-4.78
500	.00	.00	.00	.00	.00	.00	.00	-.02	-.40	-.73	-1.33	-1.96	-2.69	-3.21	-3.94	-4.69
600	.00	.00	.00	.00	.00	.00	-.19	-.69	-1.04	-1.31	-1.73	-2.20	-2.79	-3.24	-3.89	-4.62
700	-2.54	-2.54	-2.54	-2.55	-2.55	-2.55	-2.55	-2.57	-2.59	-2.61	-2.68	-2.80	-3.07	-3.36	-3.88	-4.56
800	-3.23	-3.23	-3.23	-3.23	-3.23	-3.23	-3.23	-3.24	-3.25	-3.26	-3.28	-3.34	-3.46	-3.61	-3.95	-4.53
900	-3.57	-3.57	-3.57	-3.57	-3.57	-3.57	-3.57	-3.58	-3.58	-3.59	-3.60	-3.63	-3.71	-3.81	-4.05	-4.51
1000	-3.79	-3.79	-3.79	-3.79	-3.79	-3.79	-3.79	-3.79	-3.80	-3.80	-3.81	-3.83	-3.89	-3.96	-4.14	-4.51
2000	-4.53	-4.53	-4.53	-4.53	-4.53	-4.53	-4.53	-4.53	-4.53	-4.53	-4.53	-4.54	-4.55	-4.56	-4.60	-4.71
3000	-4.76	-4.76	-4.76	-4.76	-4.76	-4.76	-4.76	-4.76	-4.76	-4.76	-4.76	-4.76	-4.77	-4.77	-4.79	-4.84

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
100	30	-5.0	100

136

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 100 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
100	30.00	28.46	27.06	25.77	24.58	23.46	18.83	12.30	7.67	3.96	-.43	-1.85	-3.39	-4.22	-4.83	-5.00
200	30.00	28.67	27.46	26.35	25.32	24.36	20.36	14.74	10.79	7.76	2.60	-.77	-2.26	-3.36	-4.43	-4.95
300	30.00	28.70	27.51	26.42	25.41	24.47	20.55	15.03	11.10	8.06	3.64	-.19	-1.85	-2.85	-4.03	-4.86
330	6.58	6.56	6.55	6.52	6.49	6.47	6.28	5.74	4.98	4.09	2.19	-.02	-1.79	-2.76	-3.94	-4.83
360	2.63	2.62	2.62	2.61	2.60	2.59	2.51	2.31	2.01	1.65	.90	.00	-1.73	-2.68	-3.86	-4.79
390	1.06	1.06	1.05	1.05	1.04	1.04	1.01	.93	.81	.67	.36	-.04	-1.69	-2.62	-3.78	-4.75
420	.43	.43	.42	.42	.42	.42	.41	.37	.33	.27	.14	-.11	-1.65	-2.56	-3.71	-4.72
450	.17	.17	.17	.17	.17	.17	.16	.15	.13	.11	.06	-.17	-1.62	-2.51	-3.65	-4.68
510	.03	.03	.03	.03	.03	.03	.03	.02	.02	.02	.01	-.29	-1.56	-2.42	-3.55	-4.61
600	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.41	-1.49	-2.32	-3.42	-4.51
700	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.49	-1.43	-2.23	-3.30	-4.41
800	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.87	-1.69	-2.31	-3.23	-4.32
900	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.14	-.91	-1.76	-2.36	-3.22	-4.25
1000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.29	-.92	-1.76	-2.36	-3.20	-4.20
2000	-3.43	-3.43	-3.43	-3.43	-3.43	-3.43	-3.43	-3.43	-3.43	-3.43	-3.44	-3.46	-3.51	-3.58	-3.75	-4.16
3000	-4.27	-4.27	-4.27	-4.27	-4.27	-4.27	-4.27	-4.27	-4.27	-4.27	-4.27	-4.28	-4.30	-4.32	-4.37	-4.53
4000	-4.62	-4.62	-4.62	-4.62	-4.62	-4.62	-4.62	-4.62	-4.62	-4.62	-4.62	-4.62	-4.63	-4.64	-4.67	-4.75
5000	-4.80	-4.80	-4.80	-4.80	-4.80	-4.80	-4.80	-4.80	-4.80	-4.80	-4.80	-4.80	-4.81	-4.81	-4.83	-4.87
6000	-4.89	-4.89	-4.89	-4.89	-4.89	-4.89	-4.89	-4.89	-4.89	-4.89	-4.89	-4.89	-4.90	-4.90	-4.91	-4.93

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
100	30	-5.0	300

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 100 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
100	30.00	28.46	27.06	25.77	24.58	23.46	18.83	12.30	7.67	3.96	-.43	-1.85	-3.39	-4.22	-4.83	-5.00
200	30.00	28.67	27.46	26.35	25.32	24.36	20.36	14.74	10.79	7.76	2.60	-.77	-2.26	-3.36	-4.43	-4.95
300	30.00	28.70	27.51	26.42	25.41	24.47	20.55	15.03	11.10	8.06	3.64	-.19	-1.85	-2.85	-4.03	-4.86
400	30.00	28.75	27.62	26.57	25.60	24.70	20.94	15.67	11.97	9.16	5.02	.65	-1.20	-2.45	-3.74	-4.74
500	30.00	28.86	27.82	26.86	25.98	25.15	21.72	16.87	13.45	10.80	6.83	2.00	-.90	-1.89	-3.38	-4.61
600	30.00	28.87	27.84	26.90	26.02	25.20	21.80	17.00	13.60	10.96	6.98	2.62	-.71	-1.72	-3.13	-4.47
700	30.00	28.87	27.84	26.90	26.02	25.21	21.81	17.01	13.61	10.97	6.99	2.91	-.52	-1.61	-2.96	-4.33
800	30.00	28.87	27.84	26.90	26.02	25.21	21.81	17.01	13.61	10.97	7.00	3.08	-.30	-1.53	-2.83	-4.21
900	30.00	28.88	27.86	26.91	26.04	25.23	21.85	17.09	13.73	11.13	7.29	3.53	-.08	-1.36	-2.73	-4.11
1000	30.00	28.94	27.97	27.08	26.25	25.49	22.28	17.78	14.59	12.13	8.48	4.57	-.00	-.64	-2.43	-4.01
1100	5.32	5.32	5.32	5.31	5.30	5.30	5.26	5.13	4.95	4.73	4.16	3.06	-.01	-.82	-2.18	-3.90
1200	2.39	2.39	2.39	2.38	2.38	2.38	2.36	2.31	2.24	2.14	1.90	1.42	-.02	-.77	-2.05	-3.78
1300	1.06	1.06	1.06	1.06	1.06	1.06	1.05	1.02	.98	.92	.77	.47	-.05	-.89	-2.04	-3.68
1400	.27	.27	.26	.26	.26	.26	.26	.25	.23	.21	.16	.09	-.13	-1.12	-2.17	-3.61
1500	.06	.06	.06	.06	.06	.06	.06	.05	.05	.05	.04	.02	-.21	-1.16	-2.21	-3.58
1600	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.00	-.29	-1.18	-2.23	-3.56
1700	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.35	-1.18	-2.23	-3.54
1800	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.40	-1.18	-2.23	-3.52
1900	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.44	-1.18	-2.22	-3.51
2000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.48	-1.17	-2.21	-3.50
3000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.36	-1.03	-1.62	-2.45	-3.54
4000	.00	.00	.00	.00	.00	-.04	-.21	-.54	-.80	-1.01	-1.33	-1.67	-2.09	-2.42	-2.95	-3.74
5000	-3.77	-3.77	-3.77	-3.77	-3.77	-3.77	-3.77	-3.77	-3.77	-3.78	-3.78	-3.79	-3.82	-3.85	-3.95	-4.23
6000	-4.36	-4.36	-4.36	-4.36	-4.36	-4.36	-4.36	-4.36	-4.37	-4.37	-4.37	-4.37	-4.39	-4.40	-4.45	-4.59

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
100	30	-5.0	1000

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 100 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
1	30.00	24.46	19.40	13.48	8.00	2.90	-3.20	-7.88	-9.46	-9.92	-10.00	-10.00	-10.00	-10.00	-10.00	-10.00
2	30.00	24.49	19.46	16.28	13.34	10.61	-.43	-6.31	-8.45	-9.48	-9.95	-10.00	-10.00	-10.00	-10.00	-10.00
3	30.00	25.93	22.21	18.58	15.23	12.11	-.08	-4.43	-7.49	-8.96	-9.83	-9.99	-10.00	-10.00	-10.00	-10.00
4	30.00	26.53	23.36	20.49	17.84	15.36	1.39	-3.55	-6.42	-8.29	-9.65	-9.97	-10.00	-10.00	-10.00	-10.00
5	30.00	26.64	23.57	20.76	18.15	15.72	4.17	-2.97	-5.82	-7.73	-9.42	-9.93	-10.00	-10.00	-10.00	-10.00
6	30.00	26.65	23.60	20.79	18.19	15.77	5.80	-2.54	-5.39	-7.28	-9.18	-9.88	-9.99	-10.00	-10.00	-10.00
7	30.00	26.66	23.60	20.80	18.20	15.78	6.78	-2.13	-5.08	-6.93	-8.94	-9.82	-9.99	-10.00	-10.00	-10.00
8	30.00	26.66	23.60	20.80	18.20	15.78	7.40	-1.72	-4.85	-6.66	-8.73	-9.75	-9.98	-10.00	-10.00	-10.00
9	30.00	26.74	23.76	21.06	18.57	16.25	8.02	-1.40	-4.59	-6.42	-8.53	-9.67	-9.97	-10.00	-10.00	-10.00
10	30.00	26.99	24.24	21.75	19.45	17.30	8.88	-.95	-4.00	-6.10	-8.35	-9.59	-9.96	-10.00	-10.00	-10.00
11	16.32	15.88	15.48	14.54	13.67	12.86	7.43	-.53	-3.35	-5.67	-8.14	-9.51	-9.95	-10.00	-10.00	-10.00
12	11.24	10.99	10.76	10.21	9.70	9.22	5.44	-.39	-2.99	-5.29	-7.92	-9.42	-9.93	-9.99	-10.00	-10.00
13	7.93	7.76	7.60	7.23	6.88	6.56	3.89	-.47	-2.89	-5.02	-7.70	-9.33	-9.92	-9.99	-10.00	-10.00
14	5.60	5.47	5.36	5.08	4.83	4.59	2.70	-.63	-2.98	-4.89	-7.50	-9.23	-9.90	-9.99	-10.00	-10.00
15	3.91	3.82	3.73	3.51	3.31	3.12	1.81	-.82	-3.15	-4.86	-7.35	-9.14	-9.88	-9.99	-10.00	-10.00
16	2.51	2.43	2.36	2.18	2.02	1.87	1.04	-1.03	-3.37	-4.89	-7.23	-9.04	-9.85	-9.98	-10.00	-10.00
17	1.47	1.42	1.37	1.25	1.14	1.04	.56	-1.11	-3.45	-4.93	-7.15	-8.96	-9.83	-9.98	-10.00	-10.00
18	.81	.78	.75	.69	.63	.57	.30	-1.20	-3.47	-4.93	-7.07	-8.88	-9.80	-9.97	-10.00	-10.00
19	.46	.44	.43	.39	.36	.32	.17	-1.27	-3.46	-4.91	-7.01	-8.80	-9.78	-9.97	-10.00	-10.00
20	.25	.24	.24	.21	.20	.18	.09	-1.34	-3.45	-4.88	-6.95	-8.73	-9.75	-9.96	-10.00	-10.00
30	.00	.00	.00	.00	.00	.00	.00	-1.65	-3.21	-4.54	-6.45	-8.20	-9.49	-9.88	-9.99	-10.00
40	.00	.00	.00	.00	.00	.00	-.92	-2.55	-3.82	-4.82	-6.33	-7.88	-9.24	-9.77	-9.98	-10.00
50	-1.08	-1.17	-1.26	-1.37	-1.47	-1.57	-2.13	-3.27	-4.26	-5.07	-6.35	-7.72	-9.06	-9.66	-9.96	-10.00
60	-5.14	-5.15	-5.16	-5.17	-5.18	-5.20	-5.27	-5.46	-5.73	-6.02	-6.70	-7.71	-8.92	-9.55	-9.93	-10.00
70	-6.31	-6.31	-6.32	-6.33	-6.33	-6.34	-6.38	-6.48	-6.62	-6.78	-7.18	-7.86	-8.85	-9.46	-9.90	-10.00
80	-6.98	-6.98	-6.99	-6.99	-7.00	-7.00	-7.02	-7.09	-7.18	-7.29	-7.56	-8.05	-8.84	-9.40	-9.87	-10.00
90	-7.43	-7.43	-7.44	-7.44	-7.44	-7.44	-7.46	-7.51	-7.57	-7.65	-7.85	-8.22	-8.86	-9.36	-9.85	-10.00
100	-7.76	-7.76	-7.76	-7.77	-7.77	-7.77	-7.78	-7.82	-7.87	-7.93	-8.08	-8.37	-8.90	-9.34	-9.82	-10.00
200	-9.00	-9.00	-9.00	-9.00	-9.00	-9.00	-9.01	-9.01	-9.02	-9.03	-9.07	-9.13	-9.27	-9.42	-9.71	-9.96
300	-9.36	-9.36	-9.36	-9.36	-9.36	-9.36	-9.36	-9.36	-9.36	-9.37	-9.38	-9.41	-9.47	-9.55	-9.71	-9.93
400	-9.52	-9.52	-9.52	-9.52	-9.52	-9.52	-9.52	-9.53	-9.53	-9.53	-9.54	-9.55	-9.59	-9.63	-9.74	-9.91
500	-9.62	-9.62	-9.62	-9.62	-9.62	-9.62	-9.62	-9.62	-9.63	-9.63	-9.63	-9.64	-9.66	-9.69	-9.76	-9.90
600	-9.69	-9.69	-9.69	-9.69	-9.69	-9.69	-9.69	-9.69	-9.69	-9.69	-9.69	-9.70	-9.72	-9.74	-9.79	-9.89

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
100	30	-10.0	10

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 100 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
10	30.00	26.99	24.24	21.75	19.45	17.30	8.88	-.95	-4.00	-6.10	-8.35	-9.59	-9.96	-10.00	-10.00	-10.00
20	30.00	27.60	25.41	23.39	21.53	19.79	12.54	2.10	-1.80	-3.73	-6.47	-8.62	-9.74	-9.96	-10.00	-10.00
30	30.00	27.65	25.51	23.55	21.73	20.04	13.10	4.66	-.53	-3.45	-5.65	-7.87	-9.42	-9.87	-9.99	-10.00
33	11.75	11.60	11.46	11.12	10.80	10.51	8.54	3.61	-.37	-2.40	-5.30	-7.67	-9.32	-9.83	-9.99	-10.00
36	6.70	6.62	6.55	6.38	6.21	6.06	5.02	2.16	-.37	-2.35	-5.03	-7.47	-9.22	-9.79	-9.98	-10.00
39	3.77	3.72	3.67	3.56	3.46	3.36	2.68	1.11	-.47	-2.65	-4.95	-7.29	-9.12	-9.75	-9.98	-10.00
42	1.85	1.82	1.79	1.72	1.66	1.60	1.21	.46	-.59	-2.75	-4.94	-7.16	-9.02	-9.70	-9.97	-10.00
45	.86	.85	.83	.80	.77	.75	.56	.20	-.75	-2.73	-4.90	-7.06	-8.93	-9.66	-9.97	-10.00
51	.18	.18	.18	.17	.16	.16	.12	.04	-1.03	-2.67	-4.78	-6.88	-8.77	-9.57	-9.95	-10.00
60	.02	.02	.02	.02	.02	.02	.01	.00	-1.30	-2.57	-4.61	-6.65	-8.55	-9.43	-9.92	-10.00
70	.00	.00	.00	.00	.00	.00	.00	-.22	-1.36	-2.50	-4.45	-6.43	-8.34	-9.28	-9.88	-10.00
80	.00	.00	.00	.00	.00	.00	.00	-.97	-2.24	-3.20	-4.69	-6.36	-8.17	-9.15	-9.84	-10.00
90	.00	.00	.00	.00	.00	.00	.00	-1.18	-2.31	-3.29	-4.77	-6.34	-8.05	-9.03	-9.79	-10.00
100	.00	.00	.00	.00	.00	.00	-.57	-1.93	-2.90	-3.68	-4.92	-6.34	-7.96	-8.93	-9.74	-9.99
200	-7.50	-7.50	-7.50	-7.50	-7.50	-7.50	-7.51	-7.53	-7.56	-7.60	-7.70	-7.89	-8.30	-8.73	-9.42	-9.94
300	-8.50	-8.50	-8.50	-8.51	-8.51	-8.51	-8.51	-8.52	-8.53	-8.54	-8.57	-8.64	-8.80	-8.99	-9.38	-9.86
400	-8.93	-8.93	-8.93	-8.93	-8.93	-8.93	-8.93	-8.93	-8.94	-8.95	-8.96	-9.00	-9.09	-9.19	-9.43	-9.81
500	-9.16	-9.16	-9.16	-9.16	-9.16	-9.16	-9.16	-9.17	-9.17	-9.17	-9.18	-9.21	-9.26	-9.33	-9.49	-9.79
600	-9.31	-9.31	-9.31	-9.31	-9.31	-9.31	-9.31	-9.32	-9.32	-9.32	-9.33	-9.34	-9.38	-9.43	-9.54	-9.78
700	-9.42	-9.42	-9.42	-9.42	-9.42	-9.42	-9.42	-9.42	-9.42	-9.42	-9.43	-9.44	-9.47	-9.50	-9.59	-9.77
800	-9.49	-9.49	-9.49	-9.49	-9.49	-9.49	-9.49	-9.50	-9.50	-9.50	-9.50	-9.51	-9.53	-9.56	-9.63	-9.78
900	-9.55	-9.55	-9.55	-9.55	-9.55	-9.55	-9.55	-9.55	-9.56	-9.56	-9.56	-9.57	-9.58	-9.60	-9.66	-9.79
1000	-9.60	-9.60	-9.60	-9.60	-9.60	-9.60	-9.60	-9.60	-9.60	-9.60	-9.61	-9.61	-9.62	-9.64	-9.69	-9.80

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
100	30	-10.0	30

140

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 100 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
10	30.00	26.99	24.24	21.75	19.45	17.30	8.88	-.95	-4.00	-6.10	-8.35	-9.59	-9.96	-10.00	-10.00	-10.00
20	30.00	27.60	25.41	23.39	21.53	19.79	12.54	2.10	-1.80	-3.73	-6.47	-8.62	-9.74	-9.96	-10.00	-10.00
30	30.00	27.65	25.51	23.55	21.73	20.04	13.10	4.66	-.53	-3.05	-5.65	-7.87	-9.42	-9.87	-9.99	-10.00
40	30.00	27.98	26.14	24.45	22.89	21.43	15.39	7.08	-.28	-1.82	-4.30	-7.12	-9.08	-9.73	-9.98	-10.00
50	30.00	28.12	26.40	24.82	23.36	22.00	16.33	8.36	.95	-1.26	-3.62	-6.42	-8.70	-9.57	-9.95	-10.00
60	30.00	28.13	26.42	24.85	23.39	22.04	16.39	8.43	2.51	-.78	-3.32	-5.97	-8.36	-9.38	-9.92	-10.00
70	30.00	28.13	26.42	24.85	23.39	22.04	16.39	8.43	3.34	-.22	-3.12	-5.66	-8.06	-9.20	-9.87	-10.00
80	30.00	28.13	26.42	24.85	23.39	22.04	16.39	8.43	3.84	.67	-2.97	-5.42	-7.81	-9.02	-9.82	-10.00
90	30.00	28.18	26.52	25.00	23.59	22.27	16.82	9.30	4.58	1.13	-2.61	-5.19	-7.60	-8.86	-9.77	-10.00
100	30.00	28.29	26.72	25.29	23.96	22.72	17.57	10.40	5.29	1.30	-1.81	-4.75	-7.37	-8.70	-9.71	-9.99
110	8.42	8.38	8.34	8.24	8.15	8.06	7.46	5.78	3.20	.79	-1.50	-4.33	-7.10	-8.54	-9.65	-9.99
120	3.69	3.67	3.65	3.60	3.56	3.52	3.22	2.37	1.29	.32	-2.06	-4.29	-6.89	-8.37	-9.58	-9.99
130	1.23	1.22	1.21	1.19	1.17	1.15	1.02	.66	.33	.07	-2.36	-4.41	-6.77	-8.23	-9.51	-9.98
140	.36	.36	.36	.35	.34	.34	.30	.19	.09	.01	-2.38	-4.42	-6.69	-8.11	-9.45	-9.98
150	.11	.10	.10	.10	.10	.10	.09	.06	.02	-.19	-2.37	-4.39	-6.61	-8.01	-9.38	-9.97
170	.01	.01	.01	.01	.01	.01	.01	.00	.00	-.66	-2.33	-4.30	-6.46	-7.83	-9.26	-9.95
200	.00	.00	.00	.00	.00	.00	.00	.00	-.50	-1.56	-2.86	-4.38	-6.29	-7.62	-9.09	-9.92
300	-2.77	-2.79	-2.80	-2.81	-2.82	-2.83	-2.91	-3.11	-3.37	-3.66	-4.29	-5.19	-6.43	-7.39	-8.70	-9.79
400	-6.62	-6.63	-6.63	-6.63	-6.63	-6.63	-6.64	-6.65	-6.68	-6.71	-6.79	-6.96	-7.33	-7.76	-8.61	-9.64
500	-7.60	-7.60	-7.60	-7.60	-7.60	-7.60	-7.60	-7.61	-7.62	-7.64	-7.68	-7.76	-7.95	-8.18	-8.71	-9.54
600	-8.12	-8.12	-8.12	-8.12	-8.12	-8.12	-8.12	-8.13	-8.13	-8.14	-8.17	-8.22	-8.33	-8.48	-8.84	-9.49
700	-8.45	-8.45	-8.45	-8.45	-8.45	-8.45	-8.45	-8.45	-8.46	-8.47	-8.48	-8.52	-8.60	-8.70	-8.95	-9.47
800	-8.68	-8.68	-8.68	-8.68	-8.68	-8.68	-8.68	-8.68	-8.69	-8.69	-8.70	-8.73	-8.79	-8.86	-9.06	-9.47
900	-8.85	-8.85	-8.85	-8.85	-8.85	-8.85	-8.85	-8.85	-8.86	-8.86	-8.87	-8.89	-8.93	-8.99	-9.14	-9.49
1000	-8.98	-8.98	-8.98	-8.98	-8.98	-8.98	-8.98	-8.98	-8.99	-8.99	-9.00	-9.01	-9.05	-9.09	-9.22	-9.50
2000	-9.56	-9.56	-9.56	-9.56	-9.56	-9.56	-9.56	-9.56	-9.56	-9.56	-9.56	-9.56	-9.57	-9.59	-9.62	-9.72
3000	-9.77	-9.77	-9.77	-9.77	-9.77	-9.77	-9.77	-9.77	-9.77	-9.77	-9.77	-9.77	-9.78	-9.78	-9.80	-9.85

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
100	30	-10.0	100

141

TEMPERATURES IN RADIAL HEAT FLOW
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LATENT HEAT DENSITY, 100 MJ/M^3

TAU \ R	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
100	30.00	28.29	26.72	25.29	23.96	22.72	17.57	10.40	5.29	1.30	-1.81	-4.75	-7.37	-8.70	-9.71	-9.99
200	30.00	28.47	27.07	25.78	24.59	23.48	18.85	12.32	7.70	4.32	-.14	-2.96	-5.59	-7.26	-9.00	-9.92
300	30.00	28.61	27.35	26.19	25.11	24.11	19.93	14.06	9.92	6.58	1.17	-1.35	-4.45	-6.34	-8.39	-9.76
330	5.42	5.41	5.40	5.37	5.34	5.31	5.13	4.58	3.81	2.80	.50	-1.49	-4.17	-6.04	-8.20	-9.71
360	1.30	1.29	1.29	1.28	1.27	1.26	1.19	.99	.72	.47	.07	-2.19	-4.33	-5.93	-8.03	-9.64
390	.21	.21	.21	.21	.21	.21	.19	.16	.12	.07	.00	-2.27	-4.39	-5.90	-7.90	-9.58
420	.03	.03	.03	.03	.03	.03	.03	.03	.02	.01	-.34	-2.28	-4.38	-5.86	-7.80	-9.52
450	.01	.01	.01	.01	.01	.01	.01	.00	.00	.00	-.63	-2.26	-4.35	-5.80	-7.71	-9.45
510	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-1.46	-2.76	-4.42	-5.72	-7.55	-9.33
600	.00	.00	.00	.00	.00	.00	.00	.00	-.40	-1.18	-2.15	-3.26	-4.69	-5.81	-7.42	-9.17
700	.00	.00	.00	.00	.00	.00	-.46	-1.24	-1.87	-2.36	-3.12	-3.99	-5.11	-6.00	-7.37	-9.02
800	-5.12	-5.13	-5.13	-5.13	-5.13	-5.13	-5.14	-5.16	-5.19	-5.22	-5.32	-5.51	-5.94	-6.43	-7.44	-8.91
900	-6.26	-6.26	-6.26	-6.26	-6.26	-6.26	-6.26	-6.27	-6.29	-6.30	-6.35	-6.45	-6.68	-6.97	-7.64	-8.85
1000	-6.90	-6.90	-6.90	-6.90	-6.90	-6.90	-6.90	-6.91	-6.92	-6.93	-6.96	-7.02	-7.18	-7.37	-7.86	-8.84
2000	-8.84	-8.84	-8.84	-8.84	-8.84	-8.84	-8.84	-8.84	-8.85	-8.85	-8.85	-8.86	-8.89	-8.92	-9.02	-9.28
3000	-9.41	-9.41	-9.41	-9.41	-9.41	-9.41	-9.41	-9.41	-9.41	-9.41	-9.41	-9.41	-9.43	-9.44	-9.49	-9.62
4000	-9.69	-9.69	-9.69	-9.69	-9.69	-9.69	-9.69	-9.69	-9.69	-9.69	-9.69	-9.69	-9.70	-9.71	-9.73	-9.80
5000	-9.83	-9.83	-9.83	-9.83	-9.83	-9.83	-9.83	-9.83	-9.83	-9.83	-9.84	-9.84	-9.84	-9.84	-9.86	-9.89
6000	-9.91	-9.91	-9.91	-9.91	-9.91	-9.91	-9.91	-9.91	-9.91	-9.91	-9.91	-9.91	-9.92	-9.92	-9.92	-9.94

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
100	30	-10.0	300

142

TEMPERATURES IN RADIAL HEAT FLOW
****

LATENT HEAT DENSITY, 100 MJ/M^3

R

TAU	1.0	1.1	1.2	1.3	1.4	1.5	2.0	3.0	4.0	5.0	7.0	10.0	15.0	20.0	30.0	50.0
100	30.00	28.29	26.72	25.29	23.96	22.72	17.57	10.40	5.29	1.30	-1.81	-4.75	-7.37	-8.70	-9.71	-9.99
200	30.00	28.47	27.07	25.78	24.59	23.48	18.85	12.32	7.70	4.32	-.14	-2.96	-5.59	-7.26	-9.00	-9.92
300	30.00	28.61	27.35	26.19	25.11	24.11	19.93	14.06	9.92	6.58	1.17	-1.35	-4.45	-6.34	-8.39	-9.76
400	30.00	28.70	27.51	26.42	25.41	24.47	20.54	15.01	11.09	8.05	2.95	-1.12	-3.55	-5.46	-7.77	-9.56
500	30.00	28.70	27.52	26.42	25.41	24.47	20.55	15.03	11.11	8.06	3.53	-.57	-3.24	-5.02	-7.30	-9.33
600	30.00	28.70	27.52	26.42	25.41	24.47	20.55	15.03	11.11	8.06	3.78	.25	-3.05	-4.74	-6.96	-9.10
700	30.00	28.76	27.64	26.60	25.64	24.74	21.01	15.77	12.06	9.21	4.98	.64	-2.49	-4.36	-6.67	-8.89
800	30.00	28.81	27.72	26.72	25.80	24.93	21.34	16.28	12.70	9.92	5.65	.73	-1.80	-3.80	-6.30	-8.70
900	30.00	28.83	27.77	26.79	25.88	25.04	21.52	16.56	13.04	10.32	6.02	.78	-1.30	-3.34	-5.94	-8.50
1000	30.00	28.87	27.83	26.88	26.00	25.18	21.76	16.95	13.53	10.89	6.92	1.80	-1.49	-3.06	-5.64	-8.31
1100	3.13	3.13	3.12	3.12	3.11	3.10	3.06	2.93	2.74	2.51	1.93	.59	-1.42	-2.92	-5.42	-8.12
1200	.44	.44	.44	.44	.44	.43	.42	.39	.34	.28	.15	.01	-2.00	-3.27	-5.33	-7.96
1300	.02	.02	.02	.02	.02	.02	.02	.02	.02	.01	.01	-.27	-2.23	-3.52	-5.41	-7.84
1400	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.63	-2.28	-3.59	-5.44	-7.76
1500	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-1.21	-2.53	-3.65	-5.44	-7.70
1600	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.29	-1.51	-2.92	-3.96	-5.53	-7.66
1700	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.96	-1.86	-3.09	-4.08	-5.60	-7.64
1800	.00	.00	.00	.00	.00	.00	.00	.00	.00	-.44	-1.21	-2.24	-3.44	-4.34	-5.71	-7.63
1900	.00	.00	.00	.00	.00	.00	.00	-.32	-.91	-1.31	-1.96	-2.75	-3.78	-4.57	-5.82	-7.64
2000	-2.44	-2.44	-2.44	-2.45	-2.45	-2.46	-2.48	-2.55	-2.64	-2.75	-3.01	-3.47	-4.20	-4.86	-5.97	-7.66
3000	-7.67	-7.67	-7.67	-7.67	-7.67	-7.67	-7.67	-7.67	-7.68	-7.68	-7.69	-7.71	-7.76	-7.83	-8.02	-8.55
4000	-8.80	-8.80	-8.80	-8.80	-8.80	-8.80	-8.80	-8.80	-8.80	-8.80	-8.81	-8.82	-8.84	-8.87	-8.97	-9.23
5000	-9.37	-9.37	-9.37	-9.37	-9.37	-9.37	-9.37	-9.37	-9.37	-9.37	-9.37	-9.38	-9.39	-9.41	-9.45	-9.59
6000	-9.66	-9.66	-9.66	-9.66	-9.66	-9.66	-9.67	-9.67	-9.67	-9.67	-9.67	-9.67	-9.68	-9.69	-9.71	-9.78

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
100	30	-10.0	1000

TEMPERATURES IN RADIAL HEAT FLOW

LATENT HEAT DENSITY, 10 MJ/M^3

N

TAU_o	0.0	.1	.2	.3	.4	.5	.7	1.0	2.0	3.0	4.0	5.0	10.0	20.0	50.0	100.0
10	10.00	6.07	4.50	3.61	2.97	2.51	1.88	1.27	.36	.10	.03	.01	.00	.00	.00	.00
30	10.00	4.90	3.51	2.73	2.19	1.78	1.21	.68	.10	.01	.00	.00	.00	.00	.00	.00
100	10.00	3.63	2.55	1.80	1.30	.94	.52	.28	.05	.01	.00	.00	.00	.00	.00	
300	10.00	2.84	1.83	1.32	1.00	.77	.46	.22	.02	.00	.00	.00	.00	.00		
1000	10.00	2.41	1.47	.95	.62	.40	.17	.05	.00	.00	.00	.00				

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
10	10	-.01	10-1000

TEMPERATURES IN RADIAL HEAT FLOW

LATENT HEAT DENSITY, 10 MJ/M^3

N

TAU_0	0.0	.1	.2	.3	.4	.5	.7	1.0	2.0	3.0	4.0	5.0	10.0	20.0
10	10.00	4.98	2.93	1.80	1.07	.52	.06	.00	-2.27	-3.13	-3.57	-3.84	-4.40	-4.69
30	10.00	3.40	1.57	.52	.12	.03	.00	-1.24	-3.09	-3.67	-3.98	-4.17	-4.57	
100	10.00	1.79	.34	.03	.00	.00	-1.47	-2.48	-3.60	-4.02	-4.24	-4.38	-4.68	
300	10.00	.80	.02	.00	.00	-1.51	-2.40	-3.04	-3.89	-4.22	-4.40	-4.52	-4.82	
1000	10.00	.15	.00	-.67	-1.87	-2.37	-2.96	-3.46	-4.25	-4.60	-4.79	-4.89		

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
10	10	-5.00	10-1000

145

TEMPERATURES IN RADIAL HEAT FLOW

LATENT HEAT DENSITY, 10 MJ/M^3

N

TAU_0	0.0	.1	.2	.3	.4	.5	.7	1.0	2.0	3.0	4.0	5.0	10.0	20.0
10	10.00	3.12	1.05	.14	.00	-1.05	-3.06	-4.63	-6.83	-7.74	-8.24	-8.55	-9.24	-9.61
30	10.00	1.30	.02	-.98	-2.75	-3.75	-4.99	-6.09	-7.70	-8.36	-8.72	-8.96	-9.45	
100	10.00	.10	-1.62	-3.57	-4.59	-5.29	-6.20	-7.03	-8.26	-8.76	-9.04	-9.21	-9.59	
300	10.00	.00	-3.58	-4.86	-5.64	-6.18	-6.92	-7.59	-8.59	-9.00	-9.23	-9.39	-9.77	
1000	10.00	-2.75	-4.84	-5.82	-6.44	-6.89	-7.50	-8.08	-9.05	-9.50	-9.73	-9.86		

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
10	10	-10.0	10-1000

146

TEMPERATURES IN RADIAL HEAT FLOW

LATENT HEAT DENSITY, 10 MJ/M^3

N

TAU_o	0.0	.1	.2	.3	.4	.5	.7	1.0	2.0	3.0	4.0	5.0	10.0	20.0	50.0	100.0
10	30.00	19.62	15.45	12.94	11.02	9.58	7.59	5.70	2.79	1.47	.78	.44	.08	.00	.00	.00
30	30.00	16.01	12.04	9.75	8.21	7.08	5.51	3.97	1.50	.75	.44	.27	.02	.00	.40	.00
100	30.00	12.86	9.42	7.47	6.12	5.10	3.73	2.57	1.03	.44	.19	.08	.00	.00	.00	
300	30.00	10.38	7.37	5.76	4.71	3.97	2.94	1.96	.54	.15	.04	.01	.00	.00		
1000	30.00	8.66	6.10	4.65	3.66	2.94	2.03	1.32	.42	.14	.05	.01				

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
10	30	-.01	10-1000

TEMPERATURES IN RADIAL HEAT FLOW
****

LATENT HEAT DENSITY, 10 MJ/M^3

TAU_o \ N	0.0	.1	.2	.3	.4	.5	.7	1.0	2.0	3.0	4.0	5.0	10.0	20.0	50.0
10	30.00	18.14	13.30	10.45	8.35	6.80	4.69	2.69	.25	.00	.00	-1.84	-3.55	-4.28	-4.71
30	30.00	14.06	9.62	7.09	5.41	4.18	2.48	.93	.00	-.78	-2.30	-2.90	-3.97	-4.48	
100	30.00	10.71	6.92	4.82	3.43	2.42	1.02	.16	.00	-2.43	-3.11	-3.49	-4.24	-4.65	
300	30.00	8.19	4.75	2.88	1.75	1.07	.26	.01	-1.91	-3.01	-3.52	-3.83	-4.57		
1000	30.00	5.69	2.94	1.49	.66	.28	.02	.00	-2.93	-3.93	-4.44	-4.70			

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
10	30	-5.00	10-1000

TEMPERATURES IN RADIAL HEAT FLOW
****

LATENT HEAT DENSITY, 10 MJ/m^3

TAU_0 \ N	0.0	.1	.2	.3	.4	.5	.7	1.0	2.0	3.0	4.0	5.0	10.0	20.0	50.0
10	30.00	16.82	11.61	8.52	6.22	4.48	2.04	.44	-2.95	-5.23	-6.35	-7.03	-8.46	-9.21	-9.68
30	30.00	12.45	7.50	4.65	2.69	1.34	.22	.00	-5.08	-6.58	-7.37	-7.86	-8.89	-9.43	
100	30.00	8.38	4.06	1.65	.48	.07	.00	-3.43	-6.37	-7.45	-8.03	-8.40	-9.17	-9.61	
300	30.00	5.46	1.76	.28	.01	.00	-3.15	-4.89	-7.10	-7.96	-8.44	-8.76	-9.54		
1000	30.00	2.52	.36	.00	-.26	-2.87	-4.58	-5.94	-8.02	-8.96	-9.45	-9.71			

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
10	30	-10.0	10-1000

149

TEMPERATURES IN RADIAL HEAT FLOW

LATENT HEAT DENSITY, 100 MJ/m^3

N

TAU_o	0.0	.1	.2	.3	.4	.5	.7	1.0	2.0	3.0	4.0	5.0	10.0	20.0	50.0	100.0
10	10.00	4.73	2.59	1.47	.61	.45	.14	.02	.00	.00	.00	.00	.00	.00	.00	.00
30	10.00	3.51	1.60	.73	.34	.15	.03	.00	.00	.00	.00	.00	.00	.00	.00	.00
100	10.00	2.01	.88	.47	.26	.14	.04	.01	.00	.00	.00	.00	.00	.00	.00	
300	10.00	2.09	.83	.33	.13	.05	.01	.00	.00	.00	.00	.00	.00	.00		
1000	10.00	1.03	.22	.05	.01	.00	.00	.00	.00	.00	.00	.00				

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
100	10	-.01	10-1000

150

TEMPERATURES IN RADIAL HEAT FLOW
****

LATENT HEAT DENSITY, 100 MJ/M^3

N

TAU_0	0.0	.1	.2	.3	.4	.5	.7	1.0	2.0	3.0	4.0	5.0	10.0	20.0
10	10.00	4.73	2.59	1.47	.81	.45	.14	.00	.00	.00	-.51	-2.70	-4.09	-4.57
30	10.00	3.40	1.55	.55	.10	.02	.00	.00	.00	-1.76	-3.23	-3.70	-4.41	-4.71
100	10.00	1.86	.24	.02	.00	.00	.00	.00	-1.80	-3.52	-3.95	-4.18	-4.61	
300	10.00	.47	.01	.00	.00	.00	.00	.00	-3.39	-4.00	-4.27	-4.43	-4.79	
1000	10.00	.06	.00	.00	.00	.00	.00	-2.45	-4.06	-4.51	-4.74	-4.86		

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
100	10	-5.00	10-1000

TEMPERATURES IN RADIAL HEAT FLOW
****

LATENT HEAT DENSITY, 100 MJ/M^3

N

TAU_0	0.0	.1	.2	.3	.4	.5	.7	1.0	2.0	3.0	4.0	5.0	10.0	20.0
10	10.00	3.27	.81	.18	.04	.01	.00	.00	-4.67	-6.75	-7.61	-8.10	-9.05	-9.52
30	10.00	1.47	.25	.01	.00	.00	.00	-3.37	-7.10	-8.04	-8.51	-8.80	-9.39	-9.69
100	10.00	.07	.00	.00	.00	.00	-5.04	-6.54	-8.14	-8.71	-9.01	-9.20	-9.59	
300	10.00	.00	.00	.00	-3.33	-5.12	-6.46	-7.39	-8.55	-8.99	-9.23	-9.39	-9.77	
1000	10.00	.00	.00	-4.79	-5.98	-6.64	-7.41	-8.07	-9.06	-9.51	-9.74	-9.86		

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
100	10	-10.0	10-1000

152

TEMPERATURES IN RADIAL HEAT FLOW
****

LATENT HEAT DENSITY, 100 MJ/M

TAU_0 \ N	0.0	.1	.2	.3	.4	.5	.7	1.0	2.0	3.0	4.0	5.0	10.0	20.0	50.0	100.0
10	30.00	18.54	13.62	10.46	8.00	6.14	3.66	1.69	.36	.11	.03	.01	.00	.00	.00	.00
30	30.00	14.74	9.75	6.67	4.60	3.18	1.75	.93	.15	.02	.00	.00	.00	.00	.00	.00
100	30.00	10.79	6.98	4.95	3.61	2.65	1.45	.58	.03	.00	.00	.00	.00	.00	.00	
300	30.00	9.21	5.50	3.44	2.17	1.37	.55	.14	.00	.00	.00	.00	.00	.00		
1000	30.00	6.01	2.72	1.25	.59	.34	.15	.05	.00	.00	.00	.00				

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
100	30	-.01	10-1000

TEMPERATURES IN RADIAL HEAT FLOW
****

LATENT HEAT DENSITY, 100 MJ/M^3

N

TAU_0	0.0	.1	.2	.3	.4	.5	.7	1.0	2.0	3.0	4.0	5.0	10.0	20.0	50.0
10	30.00	18.22	13.32	10.22	7.81	5.99	3.58	1.64	.12	.00	.00	.00	.00	-3.91	-4.62
30	30.00	14.48	9.55	6.53	4.50	3.11	1.49	.49	.00	.00	.00	.00	-3.26	-4.31	
100	30.00	10.07	5.37	2.92	1.60	.87	.26	.04	.00	.00	.00	.00	-3.95	-4.56	
300	30.00	6.51	2.60	1.05	.42	.17	.03	.00	.00	.00	.00	-3.01	-4.40	-4.91	
1000	30.00	5.27	2.37	1.05	.26	.06	.00	.00	.00	.00	-3.77	-4.37			

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
100	30	-5.00	10-1000

154

TEMPERATURES IN RADIAL HEAT FLOW
****

LATENT HEAT DENSITY, 100 MJ/M^3

N

TAU_o	0.0	.1	.2	.3	.4	.5	.7	1.0	2.0	3.0	4.0	5.0	10.0	20.0	50.0
10	30.00	16.32	11.04	7.93	5.60	3.84	1.43	.25	.00	.00	-1.22	-5.16	-8.02	-9.06	-9.63
30	30.00	11.75	6.64	3.73	1.82	.84	.18	.02	.00	-3.12	-6.11	-7.10	-8.66	-9.35	
100	30.00	8.35	3.66	1.21	.35	.10	.01	.00	-2.84	-6.63	-7.60	-8.12	-9.09	-9.59	
300	30.00	5.36	1.27	.21	.03	.01	.00	.00	-6.26	-7.66	-8.28	-8.66	-9.51	-9.93	
1000	30.00	3.08	.42	.02	.00	.00	.00	-2.55	-7.68	-8.80	-9.37	-9.67			

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
100	30	-10.0	10-1000

APPENDIX D. TABLES OF HEAT FLOW VERSUS TIME FOR A SOURCE OF FINITE DURATION

D

These tables present normalized values ω (1,1) of the heat flow from a source of radius one metre into a medium of conductivity one $Wm^{-1}K^{-1}$ for the cases given in Appendix C. The dimensionless time τ is calculated, as in Appendix C, from the diffusivity α_A of the medium in its original, or undisturbed state, A. For a particular application, tabulated values must be multiplied by the conductivity ($Wm^{-1}K^{-1}$) of the medium immediately adjacent to the source and divided by the radius (m), i.e.

$$\omega(r_o,k_A) = \omega(1,1) \times \frac{k_A}{r_o} \quad (Wm^{-2})$$

if the medium in contact with the source at that time is in its original state, or

$$\omega(r_o,k_B) = \omega(1,1) \times \frac{k_B}{r_o} \quad (Wm^{-2})$$

if the medium adjacent to the source has undergone a change of phase. The phase status of the medium in contact with the source is indicated beside each entry in the tables as "A" (undisturbed, original state) or "B" (changed phase). The notation ".AAAE+aa" is interpreted to mean ".AAA x 10^{+aa}", and a "*" replaces any value smaller than 10^{-10} Wm^{-2}.

Index blocks along the lower edge of each table identify the parametric values used: latent heat density (MJ/m^3), source and initial temperatures (^oC), and duration of source τ_o.

HEAT FLOW IN RADIAL SYMMETRY
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LATENT HEAT DENSITY, 10 MJ/M^3

TAU	HEAT FLOW		TAU	HEAT FLOW		TAU	HEAT FLOW	
1.00	.122E+02	(B)	10.00	.660E+01	(B)	10.00	.660E+01	(B)
2.00	.100E+02	(B)	20.00	.549E+01	(B)	20.00	.549E+01	(B)
3.00	.874E+01	(B)	30.00	.520E+01	(B)	30.00	.520E+01	(B)
4.00	.846E+01	(B)	33.00	.340E+00	(B)	40.00	.475E+01	(B)
5.00	.791E+01	(B)	36.00	.168E+00	(B)	50.00	.460E+01	(B)
6.00	.729E+01	(B)	39.00	.108E+00	(B)	60.00	.455E+01	(B)
7.00	.694E+01	(B)	42.00	.786E-01	(B)	70.00	.441E+01	(B)
8.00	.676E+01	(B)	45.00	.609E-01	(B)	80.00	.422E+01	(B)
9.00	.666E+01	(B)	51.00	.397E-01	(B)	90.00	.409E+01	(B)
10.00	.660E+01	(B)	60.00	.221E-01	(B)	100.00	.403E+01	(B)
11.00	.109E+01	(B)	70.00	.117E-01	(B)	110.00	.943E-01	(B)
12.00	.591E+00	(B)	80.00	.622E-02	(B)	120.00	.474E-01	(B)
13.00	.385E+00	(B)	90.00	.329E-02	(B)	130.00	.309E-01	(B)
14.00	.268E+00	(B)	100.00	.174E-02	(B)	140.00	.217E-01	(B)
15.00	.204E+00	(B)	200.00	.303E-05	(B)	150.00	.155E-01	(B)
16.00	.161E+00	(B)	300.00	.527E-08	(B)	170.00	.668E-02	(B)
17.00	.133E+00	(B)	400.00	*	(B)	200.00	.257E-02	(B)
18.00	.112E+00	(B)	500.00	*	(B)	300.00	.445E-03	(B)
19.00	.956E-01	(B)	600.00	*	(B)	400.00	.859E-04	(B)
20.00	.833E-01	(B)	700.00	*	(B)	500.00	.166E-04	(B)
30.00	.232E-01	(B)	800.00	*	(B)	600.00	.319E-05	(B)
40.00	.661E-02	(B)	900.00	*	(B)	700.00	.615E-06	(B)
50.00	.189E-02	(B)	1000.00	*	(B)	800.00	.119E-06	(B)
60.00	.539E-03	(B)	2000.00	*	(B)	900.00	.228E-07	(B)
70.00	.153E-03	(B)	3000.00	*	(B)	1000.00	.440E-08	(B)
80.00	.442E-04	(B)				2000.00	*	(B)
90.00	.126E-04	(B)				3000.00	*	(B)
100.00	.360E-05	(B)				4000.00	*	(B)
200.00	*	(B)				5000.00	*	(B)
300.00	*	(B)						
400.00	*	(B)						
500.00	*	(B)						
600.00	*	(B)						
700.00	*	(B)						
800.00	*	(B)						
900.00	*	(B)						
1000.00	*	(B)						

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
10	10	-.01	10

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
10	10	-.01	30

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
10	10	-.01	100

HEAT FLOW IN RADIAL SYMMETRY
****

LATENT HEAT DENSITY, 10 MJ/M^3

TAU	HEAT FLOW		TAU	HEAT FLOW		TAU	HEAT FLOW
100.00	.403E+01	(B)	100.00	.403E+01	(B)		
200.00	.360E+01	(B)	200.00	.360E+01	(B)		
300.00	.348E+01	(B)	300.00	.348E+01	(B)		
330.00	.270E-01	(B)	400.00	.327E+01	(B)		
360.00	.114E-01	(B)	500.00	.315E+01	(B)		
390.00	.664E-02	(B)	600.00	.312E+01	(B)		
420.00	.454E-02	(B)	700.00	.310E+01	(B)		
450.00	.337E-02	(B)	800.00	.300E+01	(B)		
510.00	.198E-02	(B)	900.00	.291E+01	(B)		
600.00	.928E-03	(B)	1000.00	.286E+01	(B)		
700.00	.400E-03	(B)	1100.00	.704E-02	(B)		
800.00	.173E-03	(B)	1200.00	.341E-02	(B)		
900.00	.748E-04	(B)	1300.00	.210E-02	(B)		
1000.00	.323E-04	(B)	1400.00	.135E-02	(B)		
2000.00	.730E-08	(B)	1500.00	.879E-03	(B)		
3000.00	*	(B)	1600.00	.573E-03	(B)		
4000.00	*	(B)	1700.00	.374E-03	(B)		
5000.00	*	(B)	1800.00	.244E-03	(B)		
6000.00	*	(B)	1900.00	.159E-03	(B)		
			2000.00	.103E-03	(B)		
			3000.00	.143E-05	(B)		
			4000.00	.198E-07	(B)		
			5000.00	.273E-09	(B)		
			6000.00	*	(B)		

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU$_o$	LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU$_o$	LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU$_o$
10	10	-.01	300	10	10	-.01	1000				

HEAT FLOW IN RADIAL SYMMETRY
****

LATENT HEAT DENSITY, 10 MJ/M^3

TAU	HEAT FLOW
1.00	.190E+02 (B)
2.00	.129E+02 (B)
3.00	.117E+02 (B)
4.00	.116E+02 (B)
5.00	.106E+02 (B)
6.00	.975E+01 (B)
7.00	.924E+01 (B)
8.00	.888E+01 (B)
9.00	.859E+01 (B)
10.00	.842E+01 (B)
11.00	.140E+01 (B)
12.00	.768E+00 (B)
13.00	.468E+00 (B)
14.00	.287E+00 (B)
15.00	.268E+00 (B)
16.00	.105E+00 (B)
17.00	.372E-01 (B)
18.00	.125E-01 (B)
19.00	.372E-02 (B)
20.00	.286E-03 (B)
30.00	.685E-01 (A)
40.00	.295E-01 (A)
50.00	.170E-01 (A)
60.00	.111E-01 (A)
70.00	.784E-02 (A)
80.00	.585E-02 (A)
90.00	.453E-02 (A)
100.00	.361E-02 (A)
200.00	.848E-03 (A)

TAU	HEAT FLOW
10.00	.842E+01 (B)
20.00	.738E+01 (B)
30.00	.663E+01 (B)
33.00	.455E+00 (B)
36.00	.219E+00 (B)
39.00	.135E+00 (B)
42.00	.309E-01 (B)
45.00	.677E-02 (B)
51.00	.256E-04 (B)
60.00	.838E-01 (A)
70.00	.336E-01 (A)
80.00	.209E-01 (A)
90.00	.146E-01 (A)
100.00	.109E-01 (A)
200.00	.208E-02 (A)
300.00	.863E-03 (A)
400.00	.470E-03 (A)

TAU	HEAT FLOW
10.00	.842E+01 (B)
20.00	.738E+01 (B)
30.00	.663E+01 (B)
40.00	.653E+01 (B)
50.00	.643E+01 (B)
60.00	.596E+01 (B)
70.00	.573E+01 (B)
80.00	.557E+01 (B)
90.00	.545E+01 (B)
100.00	.537E+01 (B)
110.00	.116E+00 (B)
120.00	.430E-01 (B)
130.00	.362E-02 (B)
140.00	.965E-04 (B)
150.00	.323E-07 (B)
170.00	.291E-01 (A)
200.00	.112E-01 (A)
300.00	.307E-02 (A)
400.00	.149E-02 (A)
500.00	.881E-03 (A)
600.00	.583E-03 (A)
700.00	.416E-03 (A)
800.00	.312E-03 (A)
900.00	.243E-03 (A)
1000.00	.195E-03 (A)

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
10	10	-5.0	10

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
10	10	-5.0	30

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
10	10	-5.0	100

HEAT FLOW IN RADIAL SYMMETRY
****

LATENT HEAT DENSITY, 10 MJ/M^3

TAU	HEAT FLOW
100.00	.537E+01 (B)
200.00	.483E+01 (B)
300.00	.454E+01 (B)
330.00	.311E-01 (B)
360.00	.149E-02 (B)
390.00	.645E-05 (B)
420.00	* (B)
450.00	.123E-01 (A)
510.00	.509E-02 (A)
600.00	.264E-02 (A)
700.00	.161E-02 (A)
800.00	.109E-02 (A)
900.00	.803E-03 (A)
1000.00	.616E-03 (A)
2000.00	.146E-03 (A)
3000.00	.700E-04 (A)

TAU	HEAT FLOW
100.00	.537E+01 (B)
200.00	.483E+01 (B)
300.00	.454E+01 (B)
400.00	.454E+01 (B)
500.00	.426E+01 (B)
600.00	.413E+01 (B)
700.00	.403E+01 (B)
800.00	.396E+01 (B)
900.00	.394E+01 (B)
1000.00	.394E+01 (B)
1100.00	.480E-02 (B)
1200.00	.174E-05 (B)
1300.00	.199E-01 (A)
1400.00	.329E-02 (A)
1500.00	.202E-02 (A)
1600.00	.147E-02 (A)
1700.00	.114E-02 (A)
1800.00	.921E-03 (A)
1900.00	.770E-03 (A)
2000.00	.660E-03 (A)
3000.00	.252E-03 (A)
4000.00	.129E-03 (A)
5000.00	.681E-04 (A)
6000.00	.360E-04 (A)

TAU	HEAT FLOW

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
10	10	-5.0	300

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
10	10	-5.0	1000

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0

160

HEAT FLOW IN RADIAL SYMMETRY
****

LATENT HEAT DENSITY, 10 MJ/M^3

TAU	HEAT FLOW
1.00	.208E+02 (B)
2.00	.189E+02 (B)
3.00	.151E+02 (B)
4.00	.139E+02 (B)
5.00	.131E+02 (B)
6.00	.124E+02 (B)
7.00	.120E+02 (B)
8.00	.116E+02 (B)
9.00	.116E+02 (B)
10.00	.116E+02 (B)
11.00	.176E+01 (B)
12.00	.587E+00 (B)
13.00	.204E+00 (B)
14.00	.113E-02 (B)
15.00	.846E+00 (A)
16.00	.499E+00 (A)
17.00	.370E+00 (A)
18.00	.290E+00 (A)
19.00	.237E+00 (A)
20.00	.200E+00 (A)
30.00	.652E-01 (A)
40.00	.328E-01 (A)
50.00	.198E-01 (A)
60.00	.133E-01 (A)
70.00	.954E-02 (A)
80.00	.719E-02 (A)
90.00	.560E-02 (A)
100.00	.449E-02 (A)
200.00	.107E-02 (A)

TAU	HEAT FLOW
10.00	.116E+02 (B)
20.00	.951E+01 (B)
30.00	.876E+01 (B)
33.00	.597E+00 (B)
36.00	.294E-01 (B)
39.00	.507E+00 (A)
42.00	.211E+00 (A)
45.00	.140E+00 (A)
51.00	.825E-01 (A)
60.00	.477E-01 (A)
70.00	.305E-01 (A)
80.00	.214E-01 (A)
90.00	.159E-01 (A)
100.00	.123E-01 (A)
200.00	.256E-02 (A)
300.00	.108E-02 (A)
400.00	.594E-03 (A)

TAU	HEAT FLOW
10.00	.116E+02 (B)
20.00	.951E+01 (B)
30.00	.876E+01 (B)
40.00	.838E+01 (B)
50.00	.838E+01 (B)
60.00	.780E+01 (B)
70.00	.754E+01 (B)
80.00	.736E+01 (B)
90.00	.721E+01 (B)
100.00	.709E+01 (B)
110.00	.538E-01 (B)
120.00	.171E+00 (A)
130.00	.660E-01 (A)
140.00	.419E-01 (A)
150.00	.302E-01 (A)
170.00	.185E-01 (A)
200.00	.109E-01 (A)
300.00	.362E-02 (A)
400.00	.182E-02 (A)
500.00	.109E-02 (A)
600.00	.732E-03 (A)
700.00	.524E-03 (A)
800.00	.394E-03 (A)
900.00	.309E-03 (A)
1000.00	.248E-03 (A)

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
10	10	-10.0	10

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
10	10	-10.0	30

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
10	10	-10.0	100

HEAT FLOW IN RADIAL SYMMETRY
****

LATENT HEAT DENSITY, 10 MJ/M^3

TAU	HEAT FLOW
100.00	.709E+01 (B)
200.00	.653E+01 (B)
300.00	.601E+01 (B)
330.00	.619E-06 (B)
360.00	.301E-01 (A)
390.00	.163E-01 (A)
420.00	.109E-01 (A)
450.00	.799E-02 (A)
510.00	.496E-02 (A)
600.00	.293E-02 (A)
700.00	.188E-02 (A)
800.00	.132E-02 (A)
900.00	.984E-03 (A)
1000.00	.763E-03 (A)
2000.00	.186E-03 (A)
3000.00	.904E-04 (A)

TAU	HEAT FLOW
100.00	.709E+01 (B)
200.00	.653E+01 (B)
300.00	.601E+01 (B)
400.00	.577E+01 (B)
500.00	.560E+01 (B)
600.00	.557E+01 (B)
700.00	.536E+01 (B)
800.00	.536E+01 (B)
900.00	.522E+01 (B)
1000.00	.513E+01 (B)
1100.00	.194E-01 (A)
1200.00	.659E-02 (A)
1300.00	.385E-02 (A)
1400.00	.265E-02 (A)
1500.00	.197E-02 (A)
1600.00	.154E-02 (A)
1700.00	.126E-02 (A)
1800.00	.105E-02 (A)
1900.00	.902E-03 (A)
2000.00	.784E-03 (A)
3000.00	.317E-03 (A)
4000.00	.164E-03 (A)
5000.00	.864E-04 (A)
6000.00	.456E-04 (A)

TAU	HEAT FLOW

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
10	10	-10.0	300

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
10	10	-10.0	1000

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o

HEAT FLOW IN RADIAL SYMMETRY
****

LATENT HEAT DENSITY, 10 MJ/M^3

TAU	HEAT FLOW
1.00	.342E+02 (B)
2.00	.270E+02 (B)
3.00	.242E+02 (B)
4.00	.220E+02 (B)
5.00	.209E+02 (B)
6.00	.201E+02 (B)
7.00	.194E+02 (B)
8.00	.187E+02 (B)
9.00	.180E+02 (B)
10.00	.176E+02 (B)
11.00	.285E+01 (B)
12.00	.161E+01 (B)
13.00	.112E+01 (B)
14.00	.827E+00 (B)
15.00	.645E+00 (B)
16.00	.510E+00 (B)
17.00	.417E+00 (B)
18.00	.345E+00 (B)
19.00	.290E+00 (B)
20.00	.251E+00 (B)
30.00	.934E-01 (B)
40.00	.479E-01 (B)
50.00	.252E-01 (B)
60.00	.109E-01 (B)
70.00	.554E-02 (B)
80.00	.353E-02 (B)
90.00	.246E-02 (B)
100.00	.176E-02 (B)
200.00	.690E-04 (B)
300.00	.273E-05 (B)
400.00	.108E-06 (B)
500.00	.425E-08 (B)
600.00	.168E-09 (B)
700.00	* (B)
800.00	* (B)
900.00	* (B)
1000.00	* (B)

TAU	HEAT FLOW
10.00	.176E+02 (B)
20.00	.152E+02 (B)
30.00	.141E+02 (B)
33.00	.962E+00 (B)
36.00	.488E+00 (B)
39.00	.313E+00 (B)
42.00	.221E+00 (B)
45.00	.168E+00 (B)
51.00	.110E+00 (B)
60.00	.699E-01 (B)
70.00	.478E-01 (B)
80.00	.340E-01 (B)
90.00	.225E-01 (B)
100.00	.144E-01 (B)
200.00	.162E-02 (B)
300.00	.311E-03 (B)
400.00	.601E-04 (B)
500.00	.115E-04 (B)
600.00	.223E-05 (B)
700.00	.430E-06 (B)
800.00	.828E-07 (B)
900.00	.160E-07 (B)
1000.00	.308E-08 (B)
2000.00	* (B)
3000.00	* (B)

TAU	HEAT FLOW
10.00	.176E+02 (B)
20.00	.152E+02 (B)
30.00	.141E+02 (B)
40.00	.133E+02 (B)
50.00	.126E+02 (B)
60.00	.123E+02 (B)
70.00	.121E+02 (B)
80.00	.117E+02 (B)
90.00	.115E+02 (B)
100.00	.113E+02 (B)
110.00	.257E+00 (B)
120.00	.125E+00 (B)
130.00	.808E-01 (B)
140.00	.589E-01 (B)
150.00	.451E-01 (B)
170.00	.271E-01 (B)
200.00	.143E-01 (B)
300.00	.447E-02 (B)
400.00	.190E-02 (B)
500.00	.822E-03 (B)
600.00	.355E-03 (B)
700.00	.153E-03 (B)
800.00	.662E-04 (B)
900.00	.286E-04 (B)
1000.00	.124E-04 (B)
2000.00	.280E-08 (B)
3000.00	* (B)
4000.00	* (B)
5000.00	* (B)

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
10	30	-.01	10

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
10	30	-.01	30

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
10	30	-.01	100

HEAT FLOW IN RADIAL SYMMETRY
****

LATENT HEAT DENSITY, 10 MJ/M^3

TAU	HEAT FLOW
100.00	.113E+02 (B)
200.00	.101E+02 (B)
300.00	.955E+01 (B)
330.00	.762E-01 (B)
360.00	.353E-01 (B)
390.00	.215E-01 (B)
420.00	.148E-01 (B)
450.00	.110E-01 (B)
510.00	.706E-02 (B)
600.00	.438E-02 (B)
700.00	.280E-02 (B)
800.00	.181E-02 (B)
900.00	.117E-02 (B)
1000.00	.770E-03 (B)
2000.00	.106E-04 (B)
3000.00	.147E-06 (B)
4000.00	.204E-08 (B)
5000.00	* (B)
6000.00	* (B)

TAU	HEAT FLOW
100.00	.113E+02 (B)
200.00	.101E+02 (B)
300.00	.955E+01 (B)
400.00	.917E+01 (B)
500.00	.885E+01 (B)
600.00	.866E+01 (B)
700.00	.855E+01 (B)
800.00	.838E+01 (B)
900.00	.822E+01 (B)
1000.00	.809E+01 (B)
1100.00	.194E-01 (B)
1200.00	.923E-02 (B)
1300.00	.596E-02 (B)
1400.00	.432E-02 (B)
1500.00	.314E-02 (B)
1600.00	.228E-02 (B)
1700.00	.170E-02 (B)
1800.00	.131E-02 (B)
1900.00	.104E-02 (B)
2000.00	.859E-03 (B)
3000.00	.238E-03 (B)
4000.00	.782E-04 (B)
5000.00	.256E-04 (B)
6000.00	.842E-05 (B)

TAU	HEAT FLOW

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
10	30	-.01	300

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
10	30	-.01	1000

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0

HEAT FLOW IN RADIAL SYMMETRY
****

LATENT HEAT DENSITY, 10 MJ/M^3

TAU	HEAT FLOW		TAU	HEAT FLOW		TAU	HEAT FLOW	
1.00	.374E+02	(B)	10.00	.200E+02	(B)	10.00	.200E+02	(B)
2.00	.307E+02	(B)	20.00	.170E+02	(B)	20.00	.170E+02	(B)
3.00	.268E+02	(B)	30.00	.161E+02	(B)	30.00	.161E+02	(B)
4.00	.254E+02	(B)	33.00	.109E+01	(B)	40.00	.150E+02	(B)
5.00	.241E+02	(B)	36.00	.541E+00	(B)	50.00	.142E+02	(B)
6.00	.226E+02	(B)	39.00	.345E+00	(B)	60.00	.138E+02	(B)
7.00	.216E+02	(B)	42.00	.243E+00	(B)	70.00	.137E+02	(B)
8.00	.209E+02	(B)	45.00	.183E+00	(B)	80.00	.135E+02	(B)
9.00	.203E+02	(B)	51.00	.117E+00	(B)	90.00	.130E+02	(B)
10.00	.200E+02	(B)	60.00	.591E-01	(B)	100.00	.128E+02	(B)
11.00	.331E+01	(B)	70.00	.172E-01	(B)	110.00	.287E+00	(B)
12.00	.186E+01	(B)	80.00	.621E-02	(B)	120.00	.137E+00	(B)
13.00	.126E+01	(B)	90.00	.517E-03	(B)	130.00	.851E-01	(B)
14.00	.896E+00	(B)	100.00	.902E-05	(B)	140.00	.599E-01	(B)
15.00	.687E+00	(B)	200.00	.579E-02	(A)	150.00	.450E-01	(B)
16.00	.540E+00	(B)	300.00	.218E-02	(A)	170.00	.287E-01	(B)
17.00	.443E+00	(B)	400.00	.115E-02	(A)	200.00	.513E-02	(B)
18.00	.368E+00	(B)	500.00	.713E-03	(A)	300.00	*	(B)
19.00	.311E+00	(B)	600.00	.485E-03	(A)	400.00	.488E-02	(A)
20.00	.268E+00	(B)	700.00	.352E-03	(A)	500.00	.248E-02	(A)
30.00	.300E-01	(B)	800.00	.267E-03	(A)	600.00	.154E-02	(A)
40.00	.899E-03	(B)	900.00	.210E-03	(A)	700.00	.106E-02	(A)
50.00	*	(B)	1000.00	.170E-03	(A)	800.00	.782E-03	(A)
60.00	.440E-01	(A)				900.00	.601E-03	(A)
70.00	.250E-01	(A)				1000.00	.479E-03	(A)
80.00	.170E-01	(A)				2000.00	.130E-03	(A)
90.00	.125E-01	(A)						
100.00	.963E-02	(A)						
200.00	.205E-02	(A)						
300.00	.873E-03	(A)						
400.00	.482E-03	(A)						
500.00	.306E-03	(A)						

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
10	30	-5.0	10

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
10	30	-5.0	30

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
10	30	-5.0	100

HEAT FLOW IN RADIAL SYMMETRY
****

LATENT HEAT DENSITY, 10 MJ/M^3

TAU	HEAT FLOW
100.00	.128E+02 (B)
200.00	.115E+02 (B)
300.00	.106E+02 (B)
330.00	.859E-01 (B)
360.00	.414E-01 (B)
390.00	.244E-01 (B)
420.00	.148E-01 (B)
450.00	.902E-02 (B)
510.00	.423E-02 (B)
600.00	.296E-03 (B)
700.00	.781E-07 (B)
800.00	.153E-01 (A)
900.00	.331E-02 (A)
1000.00	.207E-02 (A)
2000.00	.363E-03 (A)
3000.00	.171E-03 (A)
4000.00	.894E-04 (A)

TAU	HEAT FLOW
100.00	.128E+02 (B)
200.00	.115E+02 (B)
300.00	.106E+02 (B)
400.00	.105E+02 (B)
500.00	.101E+02 (B)
600.00	.972E+01 (B)
700.00	.948E+01 (B)
800.00	.939E+01 (B)
900.00	.936E+01 (B)
1000.00	.928E+01 (B)
1100.00	.213E-01 (B)
1200.00	.961E-02 (B)
1300.00	.584E-02 (B)
1400.00	.283E-02 (B)
1500.00	.122E-02 (B)
1600.00	.719E-03 (B)
1700.00	.211E-03 (B)
1800.00	.407E-04 (B)
1900.00	.487E-05 (B)
2000.00	.240E-06 (B)
3000.00	.756E-03 (A)
4000.00	.350E-03 (A)
5000.00	.183E-03 (A)
6000.00	.968E-04 (A)

TAU	HEAT FLOW

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU$_0$
10	30	-5.0	300

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU$_0$
10	30	-5.0	1000

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU$_0$

HEAT FLOW IN RADIAL SYMMETRY
****

LATENT HEAT DENSITY, 10 MJ/M^3

TAU	HEAT FLOW
1.00	.425E+02 (B)
2.00	.351E+02 (B)
3.00	.306E+02 (B)
4.00	.279E+02 (B)
5.00	.262E+02 (B)
6.00	.254E+02 (B)
7.00	.251E+02 (B)
8.00	.242E+02 (B)
9.00	.232E+02 (B)
10.00	.225E+02 (B)
11.00	.359E+01 (B)
12.00	.199E+01 (B)
13.00	.135E+01 (B)
14.00	.996E+00 (B)
15.00	.780E+00 (B)
16.00	.625E+00 (B)
17.00	.510E+00 (B)
18.00	.327E+00 (B)
19.00	.196E+00 (B)
20.00	.149E+00 (B)
30.00	.188E+00 (A)
40.00	.757E-01 (A)
50.00	.433E-01 (A)
60.00	.283E-01 (A)
70.00	.200E-01 (A)
80.00	.150E-01 (A)
90.00	.116E-01 (A)
100.00	.925E-02 (A)
200.00	.218E-02 (A)
300.00	.947E-03 (A)
400.00	.528E-03 (A)
500.00	.336E-03 (A)

TAU	HEAT FLOW
10.00	.225E+02 (B)
20.00	.197E+02 (B)
30.00	.178E+02 (B)
33.00	.120E+01 (B)
36.00	.607E+00 (B)
39.00	.394E+00 (B)
42.00	.283E+00 (B)
45.00	.171E+00 (B)
51.00	.576E-01 (B)
60.00	.889E-05 (B)
70.00	.964E-01 (A)
80.00	.550E-01 (A)
90.00	.379E-01 (A)
100.00	.281E-01 (A)
200.00	.535E-02 (A)
300.00	.222E-02 (A)
400.00	.121E-02 (A)
500.00	.743E-03 (A)
600.00	.524E-03 (A)
700.00	.382E-03 (A)
800.00	.291E-03 (A)
900.00	.230E-03 (A)
1000.00	.187E-03 (A)

TAU	HEAT FLOW
10.00	.225E+02 (B)
20.00	.197E+02 (B)
30.00	.178E+02 (B)
40.00	.167E+02 (B)
50.00	.161E+02 (B)
60.00	.160E+02 (B)
70.00	.153E+02 (B)
80.00	.149E+02 (B)
90.00	.145E+02 (B)
100.00	.142E+02 (B)
110.00	.324E+00 (B)
120.00	.155E+00 (B)
130.00	.966E-01 (B)
140.00	.310E-01 (B)
150.00	.894E-02 (B)
170.00	.965E-08 (B)
200.00	.306E-01 (A)
300.00	.794E-02 (A)
400.00	.384E-02 (A)
500.00	.228E-02 (A)
600.00	.151E-02 (A)
700.00	.108E-02 (A)
800.00	.806E-03 (A)
900.00	.628E-03 (A)
1000.00	.505E-03 (A)
2000.00	.142E-03 (A)

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
10	30	-10.0	10

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
10	30	-10.0	30

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
10	30	-10.0	100

HEAT FLOW IN RADIAL SYMMETRY
****

LATENT HEAT DENSITY, 10 MJ/M^3

TAU	HEAT FLOW	
100.00	.142E+02	(B)
200.00	.129E+02	(B)
300.00	.120E+02	(B)
330.00	.936E-01	(B)
360.00	.444E-01	(B)
390.00	.921E-02	(B)
420.00	.984E-03	(B)
450.00	.463E-08	(B)
510.00	.146E-01	(A)
600.00	.695E-02	(A)
700.00	.419E-02	(A)
800.00	.286E-02	(A)
900.00	.209E-02	(A)
1000.00	.161E-02	(A)
2000.00	.379E-03	(A)
3000.00	.183E-03	(A)
4000.00	.960E-04	(A)

TAU	HEAT FLOW	
100.00	.142E+02	(B)
200.00	.129E+02	(B)
300.00	.120E+02	(B)
400.00	.119E+02	(B)
500.00	.113E+02	(B)
600.00	.110E+02	(B)
700.00	.107E+02	(B)
800.00	.105E+02	(B)
900.00	.104E+02	(B)
1000.00	.104E+02	(B)
1100.00	.214E-01	(B)
1200.00	.587E-02	(B)
1300.00	.113E-03	(B)
1400.00	*	(B)
1500.00	.640E-02	(A)
1600.00	.417E-02	(A)
1700.00	.313E-02	(A)
1800.00	.249E-02	(A)
1900.00	.207E-02	(A)
2000.00	.176E-02	(A)
3000.00	.663E-03	(A)
4000.00	.340E-03	(A)
5000.00	.179E-03	(A)
6000.00	.947E-04	(A)

TAU	HEAT FLOW

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
10	30	-10.0	300

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
10	30	-10.0	1000

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o

HEAT FLOW IN RADIAL SYMMETRY
****

LATENT HEAT DENSITY, 100 MJ/M^3

TAU	HEAT FLOW		TAU	HEAT FLOW		TAU	HEAT FLOW	
1.00	.200E+02	(B)	10.00	.117E+02	(B)	10.00	.117E+02	(B)
2.00	.193E+02	(B)	20.00	.844E+01	(B)	20.00	.844E+01	(B)
3.00	.193E+02	(B)	30.00	.840E+01	(B)	30.00	.840E+01	(B)
4.00	.155E+02	(B)	33.00	.630E+00	(B)	40.00	.840E+01	(B)
5.00	.122E+02	(B)	36.00	.284E+00	(B)	50.00	.669E+01	(B)
6.00	.117E+02	(B)	39.00	.130E+00	(B)	60.00	.654E+01	(B)
7.00	.117E+02	(B)	42.00	.595E-01	(B)	70.00	.654E+01	(B)
8.00	.117E+02	(B)	45.00	.278E-01	(B)	80.00	.654E+01	(B)
9.00	.117E+02	(B)	51.00	.582E-02	(B)	90.00	.654E+01	(B)
10.00	.117E+02	(B)	60.00	.570E-03	(B)	100.00	.654E+01	(B)
11.00	.194E+01	(B)	70.00	.428E-04	(B)	110.00	.152E+00	(B)
12.00	.106E+01	(B)	80.00	.321E-05	(B)	120.00	.395E-01	(B)
13.00	.584E+00	(B)	90.00	.245E-06	(B)	130.00	.194E-01	(B)
14.00	.321E+00	(B)	100.00	.183E-07	(B)	140.00	.105E-01	(B)
15.00	.182E+00	(B)	200.00	*	(B)	150.00	.574E-02	(B)
16.00	.100E+00	(B)	300.00	*	(B)	170.00	.171E-02	(B)
17.00	.570E-01	(B)	400.00	*	(B)	200.00	.278E-03	(B)
18.00	.313E-01	(B)	500.00	*	(B)	300.00	.656E-06	(B)
19.00	.178E-01	(B)				400.00	.155E-08	(B)
20.00	.977E-02	(B)				500.00	*	(B)
30.00	.282E-04	(B)				600.00	*	(B)
40.00	.813E-07	(B)				700.00	*	(B)
50.00	.241E-09	(B)				800.00	*	(B)
60.00	*	(B)				900.00	*	(B)
70.00	*	(B)						
80.00	*	(B)						
90.00	*	(B)						
100.00	*	(B)						
200.00	*	(B)						
300.00	*	(B)						
400.00	*	(B)						

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
100	10	-.01	10

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
100	10	-.01	30

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
100	10	-.01	100

HEAT FLOW IN RADIAL SYMMETRY
****

LATENT HEAT DENSITY, 100 MJ/M^3

TAU	HEAT FLOW		TAU	HEAT FLOW		TAU	HEAT FLOW
100.00	.654E+01	(B)	100.00	.654E+01	(B)		
200.00	.537E+01	(B)	200.00	.537E+01	(B)		
300.00	.471E+01	(B)	300.00	.471E+01	(B)		
330.00	.444E-01	(B)	400.00	.455E+01	(B)		
360.00	.171E-01	(B)	500.00	.455E+01	(B)		
390.00	.687E-02	(B)	600.00	.455E+01	(B)		
420.00	.278E-02	(B)	700.00	.407E+01	(B)		
450.00	.112E-02	(B)	800.00	.395E+01	(B)		
510.00	.181E-03	(B)	900.00	.395E+01	(B)		
600.00	.119E-04	(B)	1000.00	.395E+01	(B)		
700.00	.574E-06	(B)	1100.00	.108E-01	(B)		
800.00	.278E-07	(B)	1200.00	.233E-02	(B)		
900.00	.134E-08	(B)	1300.00	.504E-03	(B)		
1000.00	*	(B)	1400.00	.109E-03	(B)		
2000.00	*	(B)	1500.00	.237E-04	(B)		
3000.00	*	(B)	1600.00	.510E-05	(B)		
4000.00	*	(B)	1700.00	.110E-05	(B)		
5000.00	*	(B)	1800.00	.239E-06	(B)		
6000.00	*	(B)	1900.00	.516E-07	(B)		
			2000.00	.112E-07	(B)		
			3000.00	*	(B)		
			4000.00	*	(B)		
			5000.00	*	(B)		
			6000.00	*	(B)		

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o	LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o	LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
100	10	-.01	300	100	10	-.01	1000				

170

HEAT FLOW IN RADIAL SYMMETRY
****

LATENT HEAT DENSITY, 100 MJ/M^3

TAU	HEAT FLOW		TAU	HEAT FLOW		TAU	HEAT FLOW	
1.00	.272E+02	(B)	10.00	.117E+02	(B)	10.00	.117E+02	(B)
2.00	.193E+02	(B)	20.00	.117E+02	(B)	20.00	.117E+02	(B)
3.00	.193E+02	(B)	30.00	.891E+01	(B)	30.00	.891E+01	(B)
4.00	.193E+02	(B)	33.00	.574E+00	(B)	40.00	.840E+01	(B)
5.00	.193E+02	(B)	36.00	.274E+00	(B)	50.00	.840E+01	(B)
6.00	.162E+02	(B)	39.00	.208E+00	(B)	60.00	.840E+01	(B)
7.00	.134E+02	(B)	42.00	.391E-01	(B)	70.00	.840E+01	(B)
8.00	.120E+02	(B)	45.00	.693E-02	(B)	80.00	.840E+01	(B)
9.00	.117E+02	(B)	51.00	.205E-03	(B)	90.00	.730E+01	(B)
10.00	.117E+02	(B)	60.00	.107E-05	(B)	100.00	.693E+01	(B)
11.00	.194E+01	(B)	70.00	.309E-08	(B)	110.00	.160E+00	(B)
12.00	.106E+01	(B)	80.00	*	(B)	120.00	.424E-01	(B)
13.00	.582E+00	(B)	90.00	*	(B)	130.00	.319E-02	(B)
14.00	.321E+00	(B)	100.00	*	(B)	140.00	.243E-03	(B)
15.00	.182E+00	(B)	200.00	.504E-02	(A)	150.00	.182E-04	(B)
16.00	.100E+00	(B)	300.00	.170E-02	(A)	170.00	.103E-06	(B)
17.00	.568E-01	(B)	400.00	.858E-03	(A)	200.00	*	(B)
18.00	.313E-01	(B)	500.00	.518E-03	(A)	300.00	.450E-01	(A)
19.00	.220E-01	(B)	600.00	.347E-03	(A)	400.00	.414E-02	(A)
20.00	.442E-02	(B)				500.00	.190E-02	(A)
30.00	.638E-09	(B)				600.00	.113E-02	(A)
40.00	*	(B)				700.00	.757E-03	(A)
50.00	.638E+00	(A)				800.00	.544E-03	(A)
60.00	.536E-01	(A)				900.00	.411E-03	(A)
70.00	.262E-01	(A)				1000.00	.323E-03	(A)
80.00	.163E-01	(A)						
90.00	.115E-01	(A)						
100.00	.851E-02	(A)						
200.00	.160E-02	(A)						
300.00	.659E-03	(A)						

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
100	10	-5.0	10

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
100	10	-5.0	30

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
100	10	-5.0	100

HEAT FLOW IN RADIAL SYMMETRY
****

LATENT HEAT DENSITY, 100 MJ/M^3

TAU	HEAT FLOW		TAU	HEAT FLOW		TAU	HEAT FLOW
100.00	.693E+01	(B)	100.00	.693E+01	(B)		
200.00	.654E+01	(B)	200.00	.654E+01	(B)		
300.00	.568E+01	(B)	300.00	.568E+01	(B)		
330.00	.403E-01	(B)	400.00	.537E+01	(B)		
360.00	.102E-02	(B)	500.00	.537E+01	(B)		
390.00	.255E-04	(B)	600.00	.537E+01	(B)		
420.00	.638E-06	(B)	700.00	.537E+01	(B)		
450.00	.160E-07	(B)	800.00	.492E+01	(B)		
510.00	*	(B)	900.00	.477E+01	(B)		
600.00	*	(B)	1000.00	.469E+01	(B)		
700.00	*	(B)	1100.00	.270E-02	(B)		
800.00	.459E-02	(A)	1200.00	.634E-05	(B)		
900.00	.226E-02	(A)	1300.00	.150E-07	(B)		
1000.00	.144E-02	(A)	1400.00	*	(B)		
2000.00	.224E-03	(A)	1500.00	*	(B)		
3000.00	.103E-03	(A)	1600.00	*	(B)		
			1700.00	*	(B)		
			1800.00	*	(B)		
			1900.00	.143E+00	(A)		
			2000.00	.371E-02	(A)		
			3000.00	.419E-03	(A)		
			4000.00	.198E-03	(A)		
			5000.00	.104E-03	(A)		
			6000.00	.550E-04	(A)		

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o	LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o	LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
100	10	-5.0	300	100	10	-5.0	1000				

HEAT FLOW IN RADIAL SYMMETRY
****

LATENT HEAT DENSITY, 100 MJ/M^3

TAU	HEAT FLOW		TAU	HEAT FLOW		TAU	HEAT FLOW	
1.00	.440E+02	(B)	10.00	.156E+02	(B)	10.00	.156E+02	(B)
2.00	.235E+02	(B)	20.00	.120E+02	(B)	20.00	.120E+02	(B)
3.00	.193E+02	(B)	30.00	.117E+02	(B)	30.00	.117E+02	(B)
4.00	.193E+02	(B)	33.00	.584E+00	(B)	40.00	.117E+02	(B)
5.00	.193E+02	(B)	36.00	.103E+00	(B)	50.00	.106E+02	(B)
6.00	.193E+02	(B)	39.00	.177E-01	(B)	60.00	.992E+01	(B)
7.00	.193E+02	(B)	42.00	.155E-03	(B)	70.00	.965E+01	(B)
8.00	.193E+02	(B)	45.00	.146E-05	(B)	80.00	.944E+01	(B)
9.00	.184E+02	(B)	51.00	*	(B)	90.00	.928E+01	(B)
10.00	.156E+02	(B)	60.00	.272E+00	(A)	100.00	.914E+01	(B)
11.00	.235E+01	(B)	70.00	.821E-01	(A)	110.00	.311E-01	(B)
12.00	.959E+00	(B)	80.00	.461E-01	(A)	120.00	.893E-04	(B)
13.00	.192E+00	(B)	90.00	.306E-01	(A)	130.00	.409E-07	(B)
14.00	.385E-01	(B)	100.00	.221E-01	(A)	140.00	*	(B)
15.00	.837E-02	(B)	200.00	.384E-02	(A)	150.00	*	(B)
16.00	.168E-02	(B)	300.00	.156E-02	(A)	170.00	.522E-01	(A)
17.00	.364E-03	(B)	400.00	.843E-03	(A)	200.00	.205E-01	(A)
18.00	.730E-04	(B)	500.00	.528E-03	(A)	300.00	.530E-02	(A)
19.00	.159E-04	(B)	600.00	.362E-03	(A)	400.00	.250E-02	(A)
20.00	.679E-07	(B)				500.00	.146E-02	(A)
30.00	.246E+00	(A)				600.00	.962E-03	(A)
40.00	.763E-01	(A)				700.00	.682E-03	(A)
50.00	.398E-01	(A)				800.00	.509E-03	(A)
60.00	.248E-01	(A)				900.00	.395E-03	(A)
70.00	.170E-01	(A)				1000.00	.317E-03	(A)
80.00	.124E-01	(A)						
90.00	.946E-02	(A)						
100.00	.746E-02	(A)						
200.00	.168E-02	(A)						
300.00	.722E-03	(A)						

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0	LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0	LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
100	10	-10.0	10	100	10	-10.0	30	100	10	-10.0	100

HEAT FLOW IN RADIAL SYMMETRY
****

LATENT HEAT DENSITY, 100 MJ/M^3

TAU	HEAT FLOW
100.00	.914E+01 (B)
200.00	.840E+01 (B)
300.00	.755E+01 (B)
330.00	.899E-03 (B)
360.00	.469E-07 (B)
390.00	* (B)
420.00	.750E-01 (A)
450.00	.229E-01 (A)
510.00	.949E-02 (A)
600.00	.467E-02 (A)
700.00	.277E-02 (A)
800.00	.186E-02 (A)
900.00	.134E-02 (A)
1000.00	.102E-02 (A)
2000.00	.232E-03 (A)
3000.00	.112E-03 (A)

TAU	HEAT FLOW
100.00	.914E+01 (B)
200.00	.840E+01 (B)
300.00	.755E+01 (B)
400.00	.730E+01 (B)
500.00	.712E+01 (B)
600.00	.698E+01 (B)
700.00	.687E+01 (B)
800.00	.654E+01 (B)
900.00	.654E+01 (B)
1000.00	.654E+01 (B)
1100.00	.288E-05 (B)
1200.00	* (B)
1300.00	.117E-01 (A)
1400.00	.530E-02 (A)
1500.00	.336E-02 (A)
1600.00	.242E-02 (A)
1700.00	.186E-02 (A)
1800.00	.150E-02 (A)
1900.00	.124E-02 (A)
2000.00	.106E-02 (A)
3000.00	.394E-03 (A)
4000.00	.202E-03 (A)
5000.00	.106E-03 (A)
6000.00	.562E-04 (A)

TAU	HEAT FLOW

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
100	10	-10.0	300

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
100	10	-10.0	1000

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o

HEAT FLOW IN RADIAL SYMMETRY
****

LATENT HEAT DENSITY, 100 MJ/M^3

TAU	HEAT FLOW		TAU	HEAT FLOW		TAU	HEAT FLOW	
1.00	.580E+02	(B)	10.00	.255E+02	(B)	10.00	.255E+02	(B)
2.00	.420E+02	(B)	20.00	.214E+02	(B)	20.00	.214E+02	(B)
3.00	.360E+02	(B)	30.00	.197E+02	(B)	30.00	.197E+02	(B)
4.00	.352E+02	(B)	33.00	.151E+01	(B)	40.00	.196E+02	(B)
5.00	.352E+02	(B)	36.00	.850E+00	(B)	50.00	.174E+02	(B)
6.00	.315E+02	(B)	39.00	.560E+00	(B)	60.00	.165E+02	(B)
7.00	.282E+02	(B)	42.00	.383E+00	(B)	70.00	.162E+02	(B)
8.00	.267E+02	(B)	45.00	.259E+00	(B)	80.00	.161E+02	(B)
9.00	.259E+02	(B)	51.00	.965E-01	(B)	90.00	.161E+02	(B)
10.00	.255E+02	(B)	60.00	.397E-01	(B)	100.00	.160E+02	(B)
11.00	.424E+01	(B)	70.00	.208E-01	(B)	110.00	.391E+00	(B)
12.00	.263E+01	(B)	80.00	.113E-01	(B)	120.00	.175E+00	(B)
13.00	.187E+01	(B)	90.00	.615E-02	(B)	130.00	.108E+00	(B)
14.00	.141E+01	(B)	100.00	.335E-02	(B)	140.00	.751E-01	(B)
15.00	.109E+01	(B)	200.00	.792E-05	(B)	150.00	.545E-01	(B)
16.00	.833E+00	(B)	300.00	.187E-07	(B)	170.00	.296E-01	(B)
17.00	.648E+00	(B)	400.00	*	(B)	200.00	.119E-01	(B)
18.00	.498E+00	(B)	500.00	*	(B)	300.00	.574E-03	(B)
19.00	.387E+00	(B)	600.00	*	(B)	400.00	.278E-04	(B)
20.00	.286E+00	(B)	700.00	*	(B)	500.00	.135E-05	(B)
30.00	.307E-01	(B)	800.00	*	(B)	600.00	.650E-07	(B)
40.00	.885E-02	(B)	900.00	*	(B)	700.00	.315E-08	(B)
50.00	.259E-02	(B)	1000.00	*	(B)	800.00	.152E-09	(B)
60.00	.759E-03	(B)	2000.00	*	(B)	900.00	*	(B)
70.00	.222E-03	(B)	3000.00	*	(B)	1000.00	*	(B)
80.00	.646E-04	(B)				2000.00	*	(B)
90.00	.190E-04	(B)				3000.00	*	(B)
100.00	.556E-05	(B)				4000.00	*	(B)
200.00	*	(B)				5000.00	*	(B)
300.00	*	(B)						
400.00	*	(B)						
500.00	*	(B)						
600.00	*	(B)						
700.00	*	(B)						
800.00	*	(B)						
900.00	*	(B)						
1000.00	*	(B)						

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU$_o$
100	30	-.01	10

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU$_o$
100	30	-.01	30

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU$_o$
100	30	-.01	100

175

HEAT FLOW IN RADIAL SYMMETRY
****

LATENT HEAT DENSITY, 100 MJ/M^3

TAU	HEAT FLOW	
100.00	.160E+02	(B)
200.00	.136E+02	(B)
300.00	.122E+02	(B)
330.00	.121E+00	(B)
360.00	.593E-01	(B)
390.00	.358E-01	(B)
420.00	.224E-01	(B)
450.00	.142E-01	(B)
510.00	.566E-02	(B)
600.00	.143E-02	(B)
700.00	.309E-03	(B)
800.00	.667E-04	(B)
900.00	.144E-04	(B)
1000.00	.313E-05	(B)
2000.00	*	(B)
3000.00	*	(B)
4000.00	*	(B)
5000.00	*	(B)
6000.00	*	(B)

TAU	HEAT FLOW	
100.00	.160E+02	(B)
200.00	.136E+02	(B)
300.00	.122E+02	(B)
400.00	.119E+02	(B)
500.00	.118E+02	(B)
600.00	.112E+02	(B)
700.00	.107E+02	(B)
800.00	.105E+02	(B)
900.00	.105E+02	(B)
1000.00	.105E+02	(B)
1100.00	.340E-01	(B)
1200.00	.143E-01	(B)
1300.00	.656E-02	(B)
1400.00	.261E-02	(B)
1500.00	.108E-02	(B)
1600.00	.619E-03	(B)
1700.00	.401E-03	(B)
1800.00	.270E-03	(B)
1900.00	.180E-03	(B)
2000.00	.122E-03	(B)
3000.00	.233E-05	(B)
4000.00	.447E-07	(B)
5000.00	.856E-09	(B)
6000.00	*	(B)

TAU	HEAT FLOW

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU$_o$
100	30	-.01	300

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU$_o$
100	30	-.01	1000

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU$_o$

HEAT FLOW IN RADIAL SYMMETRY
****

LATENT HEAT DENSITY, 100 MJ/M^3

TAU	HEAT FLOW		TAU	HEAT FLOW		TAU	HEAT FLOW	
1.00	.580E+02	(B)	10.00	.267E+02	(B)	10.00	.267E+02	(B)
2.00	.498E+02	(B)	20.00	.251E+02	(B)	20.00	.251E+02	(B)
3.00	.374E+02	(B)	30.00	.203E+02	(B)	30.00	.203E+02	(B)
4.00	.354E+02	(B)	33.00	.150E+01	(B)	40.00	.197E+02	(B)
5.00	.352E+02	(B)	36.00	.835E+00	(B)	50.00	.196E+02	(B)
6.00	.352E+02	(B)	39.00	.549E+00	(B)	60.00	.193E+02	(B)
7.00	.340E+02	(B)	42.00	.374E+00	(B)	70.00	.175E+02	(B)
8.00	.307E+02	(B)	45.00	.259E+00	(B)	80.00	.165E+02	(B)
9.00	.282E+02	(B)	51.00	.124E+00	(B)	90.00	.162E+02	(B)
10.00	.267E+02	(B)	60.00	.409E-01	(B)	100.00	.161E+02	(B)
11.00	.428E+01	(B)	70.00	.120E-01	(B)	110.00	.457E+00	(B)
12.00	.259E+01	(B)	80.00	.350E-02	(B)	120.00	.222E+00	(B)
13.00	.184E+01	(B)	90.00	.813E-03	(B)	130.00	.120E+00	(B)
14.00	.137E+01	(B)	100.00	.611E-04	(B)	140.00	.654E-01	(B)
15.00	.106E+01	(B)	200.00	*	(B)	150.00	.356E-01	(B)
16.00	.813E+00	(B)	300.00	.107E-01	(A)	170.00	.106E-01	(B)
17.00	.632E+00	(B)	400.00	.302E-02	(A)	200.00	.173E-02	(B)
18.00	.486E+00	(B)	500.00	.155E-02	(A)	300.00	.570E-06	(B)
19.00	.379E+00	(B)	600.00	.962E-03	(A)	400.00	*	(B)
20.00	.290E+00	(B)	700.00	.658E-03	(A)	500.00	*	(B)
30.00	.218E-01	(B)	800.00	.480E-03	(A)	600.00	*	(B)
40.00	.185E-02	(B)	900.00	.368E-03	(A)	700.00	.730E-02	(A)
50.00	.551E-05	(B)	1000.00	.291E-03	(A)	800.00	.282E-02	(A)
60.00	.159E-07	(B)				900.00	.168E-02	(A)
70.00	*	(B)				1000.00	.116E-02	(A)
80.00	*	(B)				2000.00	.213E-03	(A)
90.00	*	(B)				3000.00	.995E-04	(A)
100.00	*	(B)						
200.00	.522E-02	(A)						
300.00	.178E-02	(A)						
400.00	.899E-03	(A)						
500.00	.546E-03	(A)						
600.00	.366E-03	(A)						

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o	LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o	LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
100	30	-5.0	10	100	30	-5.0	30	100	30	-5.0	100

HEAT FLOW IN RADIAL SYMMETRY
****

LATENT HEAT DENSITY, 100 MJ/M^3

TAU	HEAT FLOW
100.00	.161E+02 (B)
200.00	.139E+02 (B)
300.00	.136E+02 (B)
330.00	.138E+00 (B)
360.00	.535E-01 (B)
390.00	.214E-01 (B)
420.00	.866E-02 (B)
450.00	.350E-02 (B)
510.00	.568E-03 (B)
600.00	.329E-04 (B)
700.00	.179E-05 (B)
800.00	.247E-07 (B)
900.00	* (B)
1000.00	* (B)
2000.00	.102E-02 (A)
3000.00	.310E-03 (A)
4000.00	.156E-03 (A)
5000.00	.819E-04 (A)
6000.00	.434E-04 (A)

TAU	HEAT FLOW
100.00	.161E+02 (B)
200.00	.139E+02 (B)
300.00	.136E+02 (B)
400.00	.131E+02 (B)
500.00	.120E+02 (B)
600.00	.118E+02 (B)
700.00	.118E+02 (B)
800.00	.118E+02 (B)
900.00	.118E+02 (B)
1000.00	.111E+02 (B)
1100.00	.305E-01 (B)
1200.00	.125E-01 (B)
1300.00	.706E-02 (B)
1400.00	.272E-02 (B)
1500.00	.588E-03 (B)
1600.00	.128E-03 (B)
1700.00	.276E-04 (B)
1800.00	.597E-05 (B)
1900.00	.129E-05 (B)
2000.00	.280E-06 (B)
3000.00	* (B)
4000.00	* (B)
5000.00	.546E-03 (A)
6000.00	.259E-03 (A)

TAU	HEAT FLOW

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
100	30	-5.0	300

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o
100	30	-5.0	1000

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_o

HEAT FLOW IN RADIAL SYMMETRY
****

LATENT HEAT DENSITY, 100 MJ/M^3

TAU	HEAT FLOW
1.00	.584E+02 (B)
2.00	.578E+02 (B)
3.00	.432E+02 (B)
4.00	.366E+02 (B)
5.00	.352E+02 (B)
6.00	.352E+02 (B)
7.00	.352E+02 (B)
8.00	.352E+02 (B)
9.00	.344E+02 (B)
10.00	.317E+02 (B)
11.00	.477E+01 (B)
12.00	.270E+01 (B)
13.00	.180E+01 (B)
14.00	.132E+01 (B)
15.00	.103E+01 (B)
16.00	.831E+00 (B)
17.00	.578E+00 (B)
18.00	.321E+00 (B)
19.00	.183E+00 (B)
20.00	.100E+00 (B)
30.00	.290E-03 (B)
40.00	.342E-09 (B)
50.00	.979E+00 (A)
60.00	.106E+00 (A)
70.00	.538E-01 (A)
80.00	.342E-01 (A)
90.00	.242E-01 (A)
100.00	.181E-01 (A)
200.00	.349E-02 (A)
300.00	.145E-02 (A)
400.00	.790E-03 (A)
500.00	.498E-03 (A)
600.00	.342E-03 (A)

TAU	HEAT FLOW
10.00	.317E+02 (B)
20.00	.251E+02 (B)
30.00	.247E+02 (B)
33.00	.164E+01 (B)
36.00	.825E+00 (B)
39.00	.525E+00 (B)
42.00	.319E+00 (B)
45.00	.150E+00 (B)
51.00	.317E-01 (B)
60.00	.309E-02 (B)
70.00	.335E-03 (B)
80.00	.159E-05 (B)
90.00	.473E-08 (B)
100.00	* (B)
200.00	.110E-01 (A)
300.00	.378E-02 (A)
400.00	.192E-02 (A)
500.00	.117E-02 (A)
600.00	.786E-03 (A)
700.00	.565E-03 (A)
800.00	.426E-03 (A)
900.00	.333E-03 (A)
1000.00	.269E-03 (A)

TAU	HEAT FLOW
10.00	.317E+02 (B)
20.00	.251E+02 (B)
30.00	.247E+02 (B)
40.00	.212E+02 (B)
50.00	.198E+02 (B)
60.00	.197E+02 (B)
70.00	.196E+02 (B)
80.00	.196E+02 (B)
90.00	.191E+02 (B)
100.00	.180E+02 (B)
110.00	.463E+00 (B)
120.00	.222E+00 (B)
130.00	.101E+00 (B)
140.00	.298E-01 (B)
150.00	.870E-02 (B)
170.00	.743E-03 (B)
200.00	.905E-05 (B)
300.00	.112E+00 (A)
400.00	.912E-02 (A)
500.00	.429E-02 (A)
600.00	.256E-02 (A)
700.00	.173E-02 (A)
800.00	.124E-02 (A)
900.00	.944E-03 (A)
1000.00	.744E-03 (A)
2000.00	.194E-03 (A)
3000.00	.944E-04 (A)

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU$_o$
100	30	-10.0	10

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU$_o$
100	30	-10.0	30

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU$_o$
100	30	-10.0	100

HEAT FLOW IN RADIAL SYMMETRY
****

LATENT HEAT DENSITY, 100 MJ/M^3

TAU	HEAT FLOW		TAU	HEAT FLOW		TAU	HEAT FLOW
100.00	.180E+02	(B)	100.00	.180E+02	(B)		
200.00	.161E+02	(B)	200.00	.161E+02	(B)		
300.00	.145E+02	(B)	300.00	.145E+02	(B)		
330.00	.139E+00	(B)	400.00	.136E+02	(B)		
360.00	.521E-01	(B)	500.00	.136E+02	(B)		
390.00	.860E-02	(B)	600.00	.136E+02	(B)		
420.00	.140E-02	(B)	700.00	.130E+02	(B)		
450.00	.228E-03	(B)	800.00	.125E+02	(B)		
510.00	.335E-05	(B)	900.00	.122E+02	(B)		
600.00	*	(B)	1000.00	.119E+02	(B)		
700.00	*	(B)	1100.00	.323E-01	(B)		
800.00	.105E-01	(A)	1200.00	.889E-02	(B)		
900.00	.512E-02	(A)	1300.00	.434E-03	(B)		
1000.00	.330E-02	(A)	1400.00	.210E-04	(B)		
2000.00	.526E-03	(A)	1500.00	.126E-05	(B)		
3000.00	.243E-03	(A)	1600.00	.296E-08	(B)		
4000.00	.127E-03	(A)	1700.00	*	(B)		
5000.00	.672E-04	(A)	1800.00	*	(B)		
6000.00	.355E-04	(A)	1900.00	*	(B)		
			2000.00	.358E-01	(A)		
			3000.00	.104E-02	(A)		
			4000.00	.491E-03	(A)		
			5000.00	.258E-03	(A)		
			6000.00	.136E-03	(A)		

LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0	LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0	LATENT HEAT DENSITY	TEMPERATURE SOURCE	TEMPERATURE INITIAL	TAU_0
100	30	-10.0	300	100	30	-10.0	1000				