

# Software Requirements Specification for Solar Water Heating Systems Incorporating Phase Change Material

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## Reference Material

This section records information for easy reference.

### Table of Units

Throughout this document SI (Système International d'Unités) is employed as the unit system. In addition to the basic units, several derived units are employed as described below. For each unit, the symbol is given followed by a description of the unit with the SI name in parentheses.

m	- for length (metre) m
kg	- for mass (kilogram) kg
s	- for time (second) s
$^{\circ}C$	- for temperature (centigrade) $^{\circ}C = K - 273.15$
J	- for energy $J = \frac{\text{kgm}^2}{\text{s}^2}$
W	- for power $W = \frac{\text{kgm}^2}{\text{s}^3}$

### Table of Symbols

The table that follows summarizes the symbols used in this document along with their units. The choice of symbols was made with the goal of being consistent with the heat transfer literature and with existing documentation for solar water heating systems. The symbols are listed in alphabetical order.

$h_c$	- convective heat transfer coefficient between clad and coolant ( $\frac{\text{kW}}{\text{m}^2\text{C}}$ )
$h_g$	- effective heat transfer coefficient between clad and fuel surface ( $\frac{\text{kW}}{\text{m}^2\text{C}}$ )

## Data Definitions

Number	DD1
Label	$h_g$
Units	$ML^0t^{-3}T^{-1}$
SI equivalent	$\frac{\text{kW}}{\text{m}^2\text{°C}}$
Equation	$h_g = \frac{2k_c h_p}{2k_c + \tau_c h_p}$
Description	<p><math>h_g</math> is the effective heat transfer coefficient between clad and fuel surface</p> <p><math>k_c</math> is the clad conductivity</p> <p><math>h_p</math> is the initial gap film conductance</p> <p><math>\tau_c</math> is the clad thickness</p> <p>NOTE: Equation taken from the code</p>
Sources	source code

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Number	DD2
Label	$h_c$
Units	$ML^0t^{-3}T^{-1}$
SI equivalent	$\frac{\text{kW}}{\text{m}^2\text{°C}}$
Equation	$h_c = \frac{2k_c h_b}{2k_c + \tau_c h_b}$
Description	<p><math>h_c</math> is the convective heat transfer coefficient between clad and coolant</p> <p><math>k_c</math> is the clad conductivity</p> <p><math>h_b</math> is the initial coolant film conductance</p> <p><math>\tau_c</math> is the clad thickness</p> <p>NOTE: Equation taken from the code</p>
Sources	source code