

SRS for h_g and h_c

Spencer Smith

May 26, 2015

s1

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
K	- for temperature (kelvin) K
$^{\circ}C$	- for temperature (centigrade) $^{\circ}C = K - 273.15$
J	- for energy $J = \frac{\text{kgm}^2}{\text{s}^2}$
cal	- for energy $\text{cal} = 4.184J = \frac{\text{kgm}^2}{\text{s}^2}$
mol	- for amount of substance (mole) mol
W	- for power $W = \frac{\text{kgm}^2}{\text{s}^3}$

s2

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 nuclear physics literature and that used in the FP manual. The SI units are listed in brackets following the definition of the symbol.

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>h_g is the effective heat transfer coefficient between clad and fuel surface</p> <p>k_c is the clad conductivity</p> <p>h_p is the initial gap film conductance</p> <p>τ_c is the clad thickness</p> <p>NOTE: Equation taken from the code</p>
Sources	source code
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>h_c is the convective heat transfer coefficient between clad and coolant</p> <p>k_c is the clad conductivity</p> <p>h_b is the initial coolant film conductance</p> <p>τ_c is the clad thickness</p> <p>NOTE: Equation taken from the code</p>
Sources	source code