NOMENCLATURE

A_{mush}	Mushy constant kg. $m^{-3}s^{-1}$
C_F	drag factor coefficient
c	specific heat, J. kg^{-1}. K^{-1}
d_f	fiber diameter, m
d_p	pore diameter, m
h_{sf}	interfacial heat transf. coeff. W. m^{-2}. K^{-1}
H_L	Latent Heat J. kg-1
k	thermal conductivity, W. m-1. K-1
K	porous permeability, m2
p	relative pressure, Pa
Pr	Prandtl number
r	radius tube, m
Re	Reynolds number
S	Source Term N. m-3
T	Time s
T	Temperature, K
Vol	Volume
V	velocity, m s-1
x	cartesian axis direction, m
y	cartesian axis direction, m
z	cartesian axis direction, m

Greek symbols

α_{sf}	specific surface area density, m-1
B	Liquid fraction
ε	porosity
γ	Thermal expansion coefficient K-1
μ	dynamic viscosity, kg. m-1.s-1
ρ	density, kg. m-3
ψ	Volume concentration of nanoparticles
ω	number of pores per inch, m-1

Subscripts

0	operating condition
df	fiber diameter
eff	effective
Foam	Metal foam
Liquidus	Liquidus temperature
NANOPCM	Nano-enhanced PCM
PCM	Phase change material
Solidus	Solidus temperature
TOTAL	Whole domain