NOMENCLATURE

A	Area, m^2
a	Radius of tube, m
Cp	Heat capacity, J/kg. K
D	Coil diameter, m
d	Tube diameter, m
D_h	Hydraulic diameter, m
e	Corrugation depth, m
F	Convective boiling enhancement factor
f	Friction factor
g	Acceleration due to gravity, m/s^2
G	Mass flux, kg/m^2s^1
h	Heat transfer coefficient, W/m^2 K
I	Current, A
L	Length, m
m	Mass flow rate, kg/s
N	Number of turns
N_d	Liquid gas density ratio
O	Volumetric flow rate, m^3/s
p	Helical pitch, m
ΔP	Pressure drop across test section, N/m^2
q	Heat flux, W/m^2
Q	Heat transfer rate, W
S	Nucleate boiling suppression
ΔT	Difference in temperature, ^{0}C
T	Temperature, ^{0}C
u	Velocity, m/s
V	Voltage, V
X	Lockhart Martinelli parameter
x	Quality

Dimensionless Numbers

Bo	Boiling number, Bo = q/Gγ
Co	Confinement number, $\mathrm{Co} = \left(\frac{\sigma}{g(\rho_l - \rho_v)d_i^2} \right)^{0.5}$
De	Dean number, $\mathrm{De} = \mathrm{Re}\sqrt{\delta}$
F_d	Froude number, $F_d = Fr\sqrt{\delta}.(1+\tan\beta)^{0.2}$, $\mathrm{Fr} = G^2/\rho^2 gd$
Gr	Grashoff number, $\mathrm{Gr} = \frac{g\alpha(T-T_b)d^3}{(\mu/\rho)^2}$
Gn	Germano number, $\mathrm{Gn} = \mathrm{Re}\left(\frac{(D/d)}{[\pi(D/d)]^2 + (p/d)^2} \right)$
He	Helical number, $\mathrm{He} = De\left[1 + \left(\frac{p}{2\pi D} \right)^2 \right]^{1/2}$
Nu	Nusselt number, $\mathrm{Nu} = \frac{h.d_i}{k}$
Pr	Prandtl number, $\mathrm{Pr} = \frac{Cp.\mu}{k}$
Ra	Rayleigh number, Ra = Gr.Pr
Re	Reynolds number, $\mathrm{Re} = \frac{d_i u \rho}{\mu}$

Greek Symbols

ϕ	DC power, W
ρ	Density, Kg/m^3
k	Thermal conductivity, W/mK
μ	Viscosity, N/m^2 s
φ	Volume concentration
σ	Surface tension, Pa.s
δ	Curvature ratio, $\delta = d/D$
τ	Torsion ratio, $\tau = p^2/((D/2)^2 + p^2)$
ϕ_L	Pressure drop multiplier

α	Coefficient of thermal expansion
β	Dimensionless parameter
γ	Latent heat of evaporation, J/kg

Subscripts

b	Bulk
bf	Base fluid
c	Coil
crit	Critical
eq	Equivalent diameter
f	Fluid
i	Inner
in	Inlet
L	Laminar
l	Liquid
nf	Nanofluid
o	Outer
opt	Optimum
out	Outlet
Reg	Regression
s	Straight
tp	Two phase
t	Tube
T	Turbulent
v	Vapour
w	Wall