

### รายการสัญลักษณ์

$A$	=	average cross-section area of packed bed, $m^2$
$c_p$	=	specific heat at pressure constant, $kJ/(kg-K)$
$FR$	=	firing rate, kW
$d$	=	particle diameter, m
$D$	=	diameter, m
$F_{i \rightarrow j}$	=	view factor from i to j
$k$	=	thermal conductivity of gas mixture, $W/(m-K)$
$L$	=	length of packed bed, m
$LHV$	=	low heating value of LPG, $kJ/m^3$
$M$	=	mass, kg
$Pe$	=	Peclet number
$U_P$	=	pressure drop across the mixing chamber and packed bed, $mmH_2O$
$PA$	=	primary aeration, % (compared with stoichiometric)
$Q$	=	volume flow rate of mixture, $m^3/s$
$S_L$	=	laminar flame speed of fuel, m/s
$T$	=	temperature, $^{\circ}C$
$t$	=	time, s
$U$	=	superficial velocity of packed bed, m/s
$V_p$	=	interstitial velocity in packed bed, m/s
$X$	=	distance, cm
$Y_{th}$	=	thermal efficiency, %
$\sim$	=	mixture viscosity, $Ns/m^2$
$\dots$	=	mixture density, $kg/m^3$
$E_n$	=	Exponential Integral Function
$I_0$	=	Intensity of Radiation from Surrounding, $W/m^2$
$I_b$	=	Black Body Radiation Intensity, $W/m^2$

LHV	=	Lower Heating Value of Kerosene, kJ/kg
$\dot{m}$	=	Mass Flow Rate, kg/s
$q_r$	=	Radiative Heat Flux, kW/m <sup>2</sup>
$\epsilon$	=	Porosity , Emissivity of Solid Porous Medium
$\Phi$	=	Equivalence Ratio
$K$	=	Absorption Coefficient
$\tau$	=	Optical Thickness
$c_1; c_2$	=	constant parameters (dimensionless)
$C$	=	ratio between the average flow velocity in the triregional method and the average flow velocity in the single region treatment (dimensionless)
$D_e$	=	annular bed external diameter (m)
$D_h$	=	annular bed equivalent diameter (m)
$D_i$	=	annular bed internal diameter (m)
$F_v$	=	viscous friction factor (dimensionless)
$K_1, K_2$	=	parameter (dimensionless)
$M$	=	Mehta and Hawley parameter (dimensionless)
$r_e$	=	annular bed external radius (m)
$r_i$	=	annular bed internal radius (m)
$R_h$	=	equivalent radius (m)
$v$	=	local velocity (m/s)
$\bar{v}$	=	average velocity (m/s)
$D_p$	=	pressure drop (Pa)
$\bar{\epsilon}$	=	average porosity (dimensionless)
$V$	=	porosity for an infinite bed of spheres (dimensionless)

### สัญลักษณ์กำกับบน

n	=	Net Value
+	=	Positive Direction
-	=	Negative Direction

**สัญลักษณ์กำกับล่าง**

pre	=	Preheat
conv	=	Convection
rad	=	Radiation
p	=	Packed bed
f	=	Final
i	=	Initial
w	=	Water
$\infty$	=	Ambient
t	=	transition region
we	=	external wall region
wi	=	internal wall region