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List of Symbols and Abbreviations

A	Cross-sectional area of square nozzle (mm^2)
B	Temperature decay rate along downstream locations (x/h)
C_{fw}	Skin friction coefficient
d_t	Diameter of the embedded straightener (mm)
F_θ	Flatness, $<\theta^4>/<\theta^2>^2$
G	Turbulent shear production
h	Nozzle height (mm)
k	Turbulent kinetic energy
l	Nozzle length (mm)
L	Non-dimensional nozzle length (l/h)
n	Velocity decay rate along downstream locations (x/h)
Q	Entrainment rate, $\left(=\Delta\rho\bar{u}dydz\right)$
Ri	Richardson number
Re	Reynolds number $=\left(\frac{u_b h}{\nu}\right)$
S_θ	Skewness, $<\theta^3>/<\theta^2>^{3/2}$
t	Temperature inside the flow domain
t_{jet}	Jet exit temperature (řC)
T	$\frac{t-t_o}{t_{jet}-t_o}$, Non-dimensional temperature
$<t'u_i'>$	Turbulent heat flux
u_b	Bulk mean velocity (m/s)
u_{jet}	Jet exit velocity (m/s)
u_{max}	Local maximum mean velocity (m/s)
x, y, z	Cartesian coordinates
X, Y, Z	Non-dimensional Cartesian coordinates
$\overline{u}, \overline{v}, \overline{w}$	mean velocity components (m/s)
$<u_i'u_j'>$	Reynolds shear stresses
y_{max}	Location of maximum velocity at jet centerline plane
$y_{1/2}/h$	Normal distance from the wall where $u(x,y,z)=u_{max}/2$
$y_{t1/2}/h$	Normal distance from the wall where $t(x,y,z)=t_{max}/2$
$z_{1/2}/h$	Lateral distance from the wall where $u(x,y,z)=u_{max}/2$
$z_{t1/2}/h$	Lateral distance from the wall where $t(x,y,z)=t_{max}/2$

Greek symbols

α, α_t	Laminar and turbulent thermal diffusivities, m^2/s

$\alpha_{t,n}$	Non-dimensional thermal diffusivity
ε	Dissipation of turbulent kinetic energy, m^2/s^3
ν, ν_t	Laminar and turbulent kinematic viscosity respectively, m^2/s
$\sigma_k, \sigma_\varepsilon$	Turbulent model constant
τ_{wall}	Wall shear stress, $\mu\left(\frac{d\bar{u}}{dy}\right)_{y=0}$
μ	Dynamic viscosity
ρ	Density of the fluid (air), kg/m^3
θ'	$<(t-t_{mean})^2>^{1/2}$
$\sigma_k, \sigma_\epsilon, \sigma_{1\epsilon}, \sigma_{2\epsilon}$	Model constants

Subscript

max	maximum
min	minimum
n	non-dimensional parameters
o	ambient conditions

Acronym and other notations

2D	Two-dimensional
3D	Three-dimensional
BTW	Bottom wall
BW	Back wall
Gr	Grashof number
IR	Infrared
LDA	Laser Doppler Anemometer
LES	Large Eddy Simulation
LS	Launder and Sharma
PDF	Probability density function
PIV	Particle Image Velocimetry
PLIF	Planar laser induced fluorescence
RANS	Reynolds Averaged Navier Stokes
Re	Reynolds number
SW	Sidewall
SWE	Sidewall enclosure
YS	Yang and Shih