

## List of Used Symbols:

$A_i$ :	cross-sectional area in front of a contraction
$A_o$ :	cross-sectional area behind a contraction
$C_C$ :	Cunningham slip correction factor
$d$ :	inner diameter (ID)
$D$ :	particle diffusion coefficient
$d_p$ :	particle diameter
$f_{calm}$ :	parameter in Grinshpun et al. (1993, 1994) (interpolation weighting factor for calm air)
$f_{moving}$ :	parameter in Grinshpun et al. (1993, 1994) (interpolation weighting factor for moving air)
$g$ :	acceleration of gravity
$I_v$ :	parameter in Hangal, Willeke (1990a, b) (describes inertial losses in the vena contracta for isoxaxial sampling)
$I_w \Downarrow$ :	parameter in Hangal, Willeke (1990a, b) (direct impaction loss parameter for non-isoaxial downward sampling)
$I_w \Uparrow$ :	parameter in Hangal, Willeke (1990a, b) (direct impaction loss parameter for non-isoaxial upward sampling)
$k$ :	parameter in Belyaev, Levin (1972, 1974) (isoaxial sampling)
$k'$ :	parameter in Heyder, Gebhart (1972) (gravitational settling)
$Kn$ :	Knudsen Number
$L$ :	tube length
$Q$ :	volumetric flow rate
$R$ :	velocity ratio
$Re$ :	Reynolds Flow Number
$Re_p$ :	Particle Reynolds Number
$Sc$ :	Schmidt Number
$Sh$ :	Sherwood Number

$Stk$ :	Stokes Number
$Stk'$ :	modified Stokes Number in Durhem, Lundgren (1980)
$U$ :	flow velocity in the sampling probe/tube
$U_0$ :	surrounding wind speed
$V_0$ :	initial velocity of the particles
$V_t$ :	turbulent inertial deposition velocity
$V_{ts}$ :	terminal settling velocity of the particles
$Z$ :	parameter in Fuchs (1964), Thomas (1958) (gravitational deposition parameter)
$\alpha$ :	parameter in Hangal, Willeke (1990a, b) (non-isoaxial sampling)
$\delta$ :	parameter in Grinshpun et al. (1993, 1994) (sampling from low-velocity gas flow)
$\epsilon$ :	parameter in Fuchs (1964), Thomas (1958) (gravitational settling)
$\eta_{asp}$ :	aspiration efficiency
$\eta_{asp, calm\ air}$ :	aspiration efficiency in calm air
$\eta_{asp, overall}$ :	overall aspiration efficiency
$\eta_{bend, inert}$ :	transport efficiency associated with inertial deposition in a bend
$\eta_{cont, inert}$ :	transport efficiency associated with inertial deposition in a contraction
$\eta_{diff}$ :	transport efficiency associated with diffusion
$\eta_{grav}$ :	transport efficiency associated with sedimentation
$\eta_{sampling}$ :	sampling efficiency
$\eta_{inlet}$ :	overall efficiency/inlet efficiency
$\eta_{trans}$ :	transmission efficiency
$\eta_{trans, grav}$ :	transmission efficiency associated with gravitational sedimentation
$\eta_{trans, inert}$ :	transmission efficiency associated with inertial deposition
$\eta_{transport}$ :	transport efficiency
$\eta_{tube\ section, mechanism}$ :	transport efficiency for each mechanism in each tube section
$\eta_{turb\ inert}$ :	transport efficiency associated with turbulent inertial deposition
$\theta_{cont}$ :	contraction half-angle
$\theta_i$ :	angle of inclination corresponding to the horizontal

$\theta_{Kr}$ :	angle of curvature of a bend
$\theta_S$ :	aspiration angle corresponding to the wind direction
$\lambda$ :	mean free path of particles
$\mu$ :	dynamic viscosity of the flow medium (air)
$\xi$ :	parameter in Willeke, Baron (2005) (diffusional losses)
$\rho_f$ :	density of the flow medium (air)
$\rho_p$ :	particle density
$\phi$ :	angle corresponding to the vertical
$\chi$ :	dynamic shape factor