

Nomenclature

Symbols defined and used locally are not included here.

A	area,	m^2
a	acceleration,	m s^{-2}
A_c	cloud radius around bubble,	m
C	solid concentration by volume fraction,	-
c	dry cake mass per unit volume filtrate,	kg m^{-3}
C_d	drag coefficient,	-
C_f	feed solid concentration by volume fraction,	-
C_u	underflow concentration by volume fraction,	-
D	vessel, or pipe, diameter,	m
d	pipe diameter,	m
d_f	fibre diameter,	m
E	efficiency,	-
F	force,	kg m s^{-2}
f	friction factor,	-
f_g	gas friction factor,	-
f_i	number of particles within an increment,	-
f_s	solids friction factor,	-
G_s	mass flux solids,	$\text{kg m}^{-2} \text{s}^{-1}$
h	pressure head; i.e. equivalent to height of liquid,	m
H	height of channel, or vessel,	m
H_i	height of suspension at some time,	m
H_o	original height of suspension,	m
k	permeability to fluid flow,	m^2
L	length of pipe or bed,	m
m_i	mass fraction within a size range, or increment,	-
m_p	mass of particle,	kg
N	mass concentration of particles,	kg m^{-3}
N_o	original mass concentration of particles,	kg m^{-3}
P_H	Heywood settling factor, see page 50,	m^{-1}
Q	volume flow rate,	$\text{m}^3 \text{s}^{-1}$
Q_H	Heywood settling factor, see page 50,	m s^{-1}
R	shear stress,	$\text{kg m}^{-1} \text{s}^{-2}$
R_m	filter medium resistance,	m^{-1}
r	radial coordinate,	m
r_c	radial position of cake in filtering centrifuge,	m
r_{cr}	start radius for critical particle size,	m
R_f	recovery of flow to underflow of hydrocyclone,	-
r_L	inner radial position of liquid in a centrifuge,	m
R_o	equilibrium orbit radius,	m
r_o	radius of a centrifuge,	m
r_t	target radius,	m
R_b	bubble radius,	m

S_v	specific surface area per unit volume,	$\text{m}^2 \text{m}^{-3}$
s	slurry concentration by mass fraction,	-
t	time,	s
U	interstitial velocity,	m s^{-1}
u	fluid velocity,	m s^{-1}
U_b	bubble velocity,	m s^{-1}
u_g	gas velocity (can include entrained solids with no slip),	m s^{-1}
U_{mf}	minimum fluidising velocity,	m s^{-1}
U_o	superficial velocity,	m s^{-1}
U_p	particle velocity,	m s^{-1}
U_r	radial gas velocity,	m s^{-1}
u_r	radial velocity,	m s^{-1}
u_s	solids velocity with slip ($u_s < u_g$),	m s^{-1}
U_t	terminal settling velocity,	m s^{-1}
U_θ	angular gas velocity,	m s^{-1}
u_θ	tangential velocity,	m s^{-1}
V	volume of fluid,	m^3
W	channel width,	m
\bar{x}	particle diameter,	m
\bar{x}	mean particle diameter,	m
\bar{x}_i	mid-particle diameter within a size range, or increment,	m
x_{Sv}	Sauter mean diameter,	m
z	height, or axial distance, coordinate,	m
z_s	stop distance,	m
Greek		
α	specific resistance of filter cake,	m kg^{-1}
α_f	packing density of fibres,	-
α_s	volume fraction of liquid in spray tower,	-
ΔP	pressure difference, or drop,	$\text{kg m}^{-1} \text{s}^{-2}$
ε	void fraction, voidage or porosity,	-
η	particle removal efficiency,	-
η_s	single fibre, or target, particle removal efficiency,	-
λ	bed filtration constant,	m^{-1}
μ	fluid viscosity,	$\text{kg m}^{-1} \text{s}^{-1}$
ρ	fluid density,	kg m^{-3}
ρ_b	bulk density,	kg m^{-3}
ρ_m	mean suspension density,	kg m^{-3}
ρ_s	solid density,	kg m^{-3}
σ	normal stress,	$\text{kg m}^{-1} \text{s}^{-2}$
τ	shear stress,	$\text{kg m}^{-1} \text{s}^{-2}$
ω	angular velocity,	s^{-1}