Chapter 22

Alphabetical List of Input Parameters

This appendix lists all of the input parameters for FDS in separate tables grouped by namelist, these tables are in alphabetical order along with the parameters within them. This is intended to be used as a quick reference and does not replace reading the detailed description of the parameters in the main body of this guide. See Table 5.1 for a cross-reference of relevant sections and the tables in this appendix. The reason for this statement is that many of the listed parameters are mutually exclusive – specifying more than one can cause the program to either fail or run in an unpredictable manner. Also, some of the parameters trigger the code to work in a certain mode when specified. For example, specifying the thermal conductivity of a solid surface triggers the code to assume the material to be thermally-thick, mandating that other properties be specified as well. Simply prescribing as many properties as possible from a handbook is bad practice. Only prescribe those parameters which are necessary to describe the desired scenario. Note that you may use the character string `FYI` on any namelist line to make a note or comment.

22.1 `BNDF` (Boundary File Parameters)

Table 22.1: For more information see Section 21.5.

`BNDF` (Boundary File Parameters)				
`CELL_CENTERED`	Logical	Section 21.5		`F`
`MATL_ID`	Character	Section 21.12		
`PART_ID`	Character	Section 21.12		
`PROP_ID`	Character	Section 21.5		
`QUANTITY`	Character	Section 21.12		
`SPEC_ID`	Character	Section 21.12		
`TEMPORAL_STATISTIC`	Character	Section 21.5		

22.2 `CATF` (Concatenate Input Files Parameters)

Table 22.2: For more information see Section 5.4.

`CATF` (Concatenate Input Files Parameters)				
`OTHER_FILES`	Character Array	Section 5.4		

22.3 CLIP (Clipping Parameters)

Table 22.3: For more information see Section 7.11.

CLIP (Specified Upper and Lower Limits)				
CLIP_DT_RESTRICTIONS_MAX	Integer	Section 7.11.2		5
MAXIMUM_DENSITY	Real	Section 7.11.2	kg/m^3	
MAXIMUM_TEMPERATURE	Real	Section 7.11.1	°C	
MINIMUM_DENSITY	Real	Section 7.11.2	kg/m^3	
MINIMUM_TEMPERATURE	Real	Section 7.11.1	°C	

22.4 COMB (General Combustion Parameters)

Table 22.4: For more information see Chapter 15.

COMB (General combustion parameters)				
AIT_EXCLUSION_ZONE(6,:)	Real Array	Section 15.1.7	m	
AUTO_IGNITION_TEMPERATURE	Real	Section 15.1.7	°C	-273 °C
CHECK_REALIZABILITY	Logical	Section 15.3.4		F
EXTINCTION_MODEL	Character	Section 15.1.6		'EXTINCTION 2'
FIXED_MIX_TIME	Real	Section 15.1.5	s	
FREE_BURN_TEMPERATURE	Real	Section 15.1.6	°C	600
FUEL_C_TO_CO_FRACTION	Real	Section 15.1.3		2/3
FUEL_H_TO_H2_FRACTION	Real	Section 15.1.3		0
FUEL_N_TO_HCN_FRACTION	Real	Section 15.1.3		1/5
INITIAL_UNMIXED_FRACTION	Real	Section 15.1.5		1.0
MAX_CHEMISTRY_SUBSTEPS	Integer	Section 15.3.4		20
N_FIXED_CHEMISTRY_SUBSTEPS	Integer	Section 15.3.4		-1
N_SIMPLE_CHEMISTRY_REACTIONS	Integer	Section 15.1.3		1
ODE_SOLVER	Character	Section 15.3.4		
RADIATIVE_FRACTION	Real	Section 16.1		
RICHARDSON_ERROR_TOLERANCE	Real	Section 15.3.4		1.0 E-6
SUPPRESSION	Logical	Section 15.1.6		T
TAU_CHEM	Real	Section 15.1.5		1.E-10
TAU_FLAME	Real	Section 15.1.5		1.E10

22.5 CSVF (Comma Separated Velocity Files)

Table 22.5: For more information see Section 8.5.

CSVF (Comma Delimited Output Files)				
PER_MESH	Logical	Section 8.5		F

Table 22.5: Continued

CSVF (Comma Delimited Output Files)				
UVWFILE	Character	Section 8.5		

22.6 CTRL (Control Function Parameters)

Table 22.6: For more information see Section 20.5.

CTRL (Control Function Parameters)				
CONSTANT	Real	Section 20.5.6		
DELAY	Real	Section 20.5.10	s	0.
DIFFERENTIAL_GAIN	Real	Section 20.5.7		0.
FUNCTION_TYPE	Character	Section 20.4		
ID	Character	Section 20.5		
INITIAL_STATE	Logical	Section 20.4		F
INPUT_ID	Char. Array	Section 20.5		
INTEGRAL_GAIN	Real	Section 20.5.7		0.
LATCH	Logical	Section 20.4		T
N	Integer	Section 20.5		1
ON_BOUND	Character	Section 20.5.3		LOWER
PERCENTILE	Real	Section 20.5.8		
PROPORTIONAL_GAIN	Real	Section 20.5.7		0.
RAMP_ID	Character	Section 20.5.5		
SETPOINT(2)	Real	Section 20.4		
TARGET_VALUE	Real	Section 20.5.7		0.
TRIP_DIRECTION	Integer	Section 20.4		1

22.7 DEVC (Device Parameters)

Table 22.7: For more information see Section 20.1.

DEVC (Device Parameters)				
ABSOLUTE_VALUE	Logical	Section 20.2		F
BYPASS_FLOWRATE	Real	Section 20.3.7	kg/s	0
CELL_L	Real	Section 21.14	m	
CONVERSION_ADDEND	Real	Section 20.2		0
CONVERSION_FACTOR	Real	Section 20.2		1
COORD_FACTOR	Real	Section 21.2.5		1
CTRL_ID	Character	Section 20.6.1		
DB	Character	Section 21.2.3		
DELAY	Real	Section 20.3.7	s	0
DEPTH	Real	Section 21.10.15	m	0

Table 22.7: Continued

DEVC (Device Parameters)				
DEVC_ID	Character	Sections 20.3.7 and 20.6.1		
D_ID	Character	Section 21.2.5		
DRY	Logical	Section 21.10.20		F
DUCT_ID	Character	Section 12.2		
DX	Real	Section 21.2.5	m	0
DY	Real	Section 21.2.5	m	0
DZ	Real	Section 21.2.5	m	0
FLOWRATE	Real	Section 20.3.7	kg/s	0
FORCE_DIRECTION	Real(3)	Section 21.10.19		
HIDE_COORDINATES	Logical	Section 21.2.5		F
ID	Character	Section 20.1		
INITIAL_STATE	Logical	Section 20.4		F
INIT_ID	Character	Section 17.4		
IOR	Integer	Section 20.1		
LATCH	Logical	Section 20.4		T
MATL_ID	Character	Section 21.10.15		
MOVE_ID	Character	Section 21.2.5		
N_INTERVALS	Integer	Section 21.2.4		10
NODE_ID	Character(2)	Section 12.2		
NO_UPDATE_CTRL_ID	Character	Section 20.6.2		
NO_UPDATE_DEVC_ID	Character	Section 20.6.2		
ORIENTATION	Real Triplet	Section 20.1		0,0,-1
OUTPUT	Logical	Section 20.2		T
PART_ID	Character	Section 21.12		
PIPE_INDEX	Integer	Section 20.3.1		1
POINTS	Integer	Section 21.2.5		1
POINTS_ARRAY_X	Real Array	Section 21.2.5	m	
POINTS_ARRAY_Y	Real Array	Section 21.2.5	m	
POINTS_ARRAY_Z	Real Array	Section 21.2.5	m	
PROP_ID	Character	Section 20.1		
QUANTITY	Character	Section 20.1		
QUANTITY2	Character	Section 21.2.5		
QUANTITY_RANGE	Real(2)	Section 21.2.3		-1.E50,1.E50
REAC_ID	Character	Section 21.13		
RELATIVE	Logical	Section 20.2		F
R_ID	Character	Section 21.2.5		
ROTATION	Real	Section 20.1	deg.	0
SETPOINT	Real	Section 20.4		
SMOOTHING_FACTOR	Real	Section 20.4		0
SPATIAL_STATISTIC	Character	Section 21.2.3		
SPEC_ID	Character	Section 21.12		
STATISTICS_END	Real	Section 21.2.4	s	T_BEGIN
STATISTICS_START	Real	Section 21.2.4	s	T_BEGIN

Table 22.7: Continued

DEVC (Device Parameters)				
SURF_ID	Character	Section 21.2.3		
TEMPORAL_STATISTIC	Character	Section 21.2.3		
TIME_AVERAGED	Logical	Section 20.2		
TIME_HISTORY	Logical	Section 21.2.5		
TIME_PERIOD	Real	Section 21.2.4	s	
TRIP_DIRECTION	Integer	Section 20.4		1
UNITS	Character	Section 20.2		
VELO_INDEX	Integer	Section 21.10.22		0
XB(6)	Real Sextuplet	Section 21.2.3	m	
XBP(6)	Real Sextuplet	Section 21.2.5	m	
XYZ(3)	Real Triplet	Section 20.1	m	
X_ID	Character	Section 21.2.5		ID-x
Y_ID	Character	Section 21.2.5		ID-y
Z_ID	Character	Section 21.2.5		ID-z
XYZ_UNITS	Character	Section 21.2.5		'm'

22.8 DUMP (Output Parameters)

Table 22.8: For more information see Section 21.1.

DUMP (Output Parameters)				
CFL_FILE	Logical	Section 6.2.2		F
CLIP_RESTART_FILES	Logical	Section 7.3		T
COLUMN_DUMP_LIMIT	Logical	Section 20.2		F
CTRL_COLUMN_LIMIT	Integer	Section 20.2		254
DEVC_COLUMN_LIMIT	Integer	Section 20.2		254
DT_BNDF	Real	Section 21.1	s	Δt/NFRAMES
DT_CPU	Real	Section 25.6	s	$2\Delta t$
DT_CTRL	Real	Section 21.1	s	Δt/NFRAMES
DT_DEVC	Real	Section 21.1	s	Δt/NFRAMES
DT_FLUSH	Real	Section 21.1	s	Δt/NFRAMES
DT_HRR	Real	Section 21.1	s	Δt/NFRAMES
DT_ISOF	Real	Section 21.1	s	Δt/NFRAMES
DT_MASS	Real	Section 21.1	s	Δt/NFRAMES
DT_PART	Real	Section 21.1	s	Δt/NFRAMES
DT_PL3D	Real	Section 21.1	s	$2\Delta t$
DT_PROF	Real	Section 21.1	s	Δt/NFRAMES
DT_RADF	Real	Section 21.10.13	s	$2\Delta t$
DT_RESTART	Real	Section 21.1	s	$2\Delta t$
DT_SL3D	Real	Section 21.1	s	$2\Delta t$
DT_SLCF	Real	Section 21.1	s	Δt/NFRAMES
DT_SMOKE3D	Real	Section 21.1	s	Δt/NFRAMES

Table 22.8: Continued

DUMP (Output Parameters)				
DT_UVW	Real	Section 21.1	s	$2\Delta t$
EB_PART_FILE	Logical	Section 25.12		F
FLUSH_FILE_BUFFERS	Logical	Section 21.1		T
HRR_GAS_ONLY	Logical	Section 21.10.1		F
MASS_FILE	Logical	Section 21.1		F
MAXIMUM_PARTICLES	Integer	Section 21.1		1000000
NFRAMES	Integer	Section 21.1		1000
PLOT3D_PART_ID(5)	Char. Quint	Section 21.7		
PLOT3D_QUANTITY(5)	Char. Quint	Section 21.7		
PLOT3D_SPEC_ID(5)	Char. Quint	Section 21.7		
PLOT3D_VELO_INDEX	Int. Quint	Section 21.10.22		0
RAMP_BNDF	Character	Section 21.1		
RAMP_CPU	Character	Section 25.6		
RAMP_CTRL	Character	Section 21.1		
RAMP_DEVC	Character	Section 21.1		
RAMP_FLUSH	Character	Section 21.1		
RAMP_HRR	Character	Section 21.1		
RAMP_ISOF	Character	Section 21.1		
RAMP_MASS	Character	Section 21.1		
RAMP_PART	Character	Section 21.1		
RAMP_PL3D	Character	Section 21.1		
RAMP_PROF	Character	Section 21.1		
RAMP_RADF	Character	Section 21.10.13		
RAMP_RESTART	Character	Section 21.1		
RAMP_SL3D	Character	Section 21.1		
RAMP_SLCF	Character	Section 21.1		
RAMP_SMOKE3D	Character	Section 21.1		
RAMP_UVW	Character	Section 21.1		
RENDER_FILE	Character	Reference [2]		
SIG_FIGS	Integer	Section 21.10.25		8
SIG_FIGS_EXP	Integer	Section 21.10.25		3
SMOKE3D	Logical	Section 21.8		T
STATUS_FILES	Logical	Section 21.1		F
SUPPRESS_DIAGNOSTICS	Logical	Section 3.5		F
VELOCITY_ERROR_FILE	Logical	Section 21.10.24		F
WRITE_XYZ	Logical	Section 21.7		F

Δt=T_END-T_BEGIN

22.9 HEAD (Header Parameters)

Table 22.9: For more information see Section 6.1.

HEAD (Header Parameters)				
CHID	Character	Section 6.1		'output'
TITLE	Character	Section 21.7		

22.10 HOLE (Obstruction Cutout Parameters)

Table 22.10: For more information see Section 10.2.7.

HOLE (Obstruction Cutout Parameters)				
COLOR	Character	Section 10.4		
CTRL_ID	Character	Section 10.2.7		
DEVC_ID	Character	Section 10.2.7		
ID	Character	Identifier for input line		
MULT_ID	Character	Section 10.5		
RGB(3)	Integer Triplet	Section 10.4		
TRANSPARENCY	Real	Section 10.2.7		
XB(6)	Real Sextuplet	Section 10.5	m	

22.11 HVAC (HVAC System Definition)

Table 22.11: For more information see Section 12.2.

HVAC (HVAC System Definition)				
AIRCOIL_ID	Character	Section 12.2.1		
AMBIENT	Logical	Section 12.2.3		F
AREA	Real	Section 12.2.1	m^2	
CLEAN_LOSS	Real	Section 12.2.5		
COOLANT_MASS_FLOW	Real	Section 12.2.6	kg/s	
COOLANT_SPECIFIC_HEAT	Real	Section 12.2.6	kJ/(kg · K)	
COOLANT_TEMPERATURE	Real	Section 12.2.6	°C	
CTRL_ID	Character	Sections 12.2.1, 12.2.4, 12.2.5		
DAMPER	Logical	Sections 12.2.1, 12.2.2		F
DEVC_ID	Character	Sections 12.2.1, 12.2.4, 12.2.5		
DIAMETER	Real	Section 12.2.1	m	
DUCT_ID	Char. Array	Section 12.2.3		
DUCT_INTERP_TYPE	Character	Section 12.2.8		'NODE1'
EFFICIENCY	Real Array	Sections 12.2.5, 12.2.6		1.0
FAN_ID	Character	Section 12.2.1		
FILTER_ID	Character	Section 12.2.3		
FIXED_Q	Real	Section 12.2.6	kW	
ID	Character	Section 12.2		

Table 22.11: Continued

HVAC (HVAC System Definition)				
LEAK_ENTHALPY	Logical	Section 12.3.2		F
LENGTH	Real	Section 12.2.1	m	
LOADING	Real Array	Section 12.2.5	kg	0.0
LOADING_MULTIPLIER	Real Array	Section 12.2.5	1/kg	1.0
LOSS	Real Array	Sections 12.2.1 – 12.2.5		0.0
MASS_FLOW	Real	Section 12.2.1	kg/s	
MAX_FLOW	Real	Section 12.2.4	m^3/s	
MAX_PRESSURE	Real	Section 12.2.4	Pa	
N_CELLS	Integer	Section 12.2.8		10*LENGTH
NODE_ID	Char. Doublet	Section 12.2.1		
PERIMETER	Real	Section 12.2.1	m	
RAMP_ID	Character	Sections 12.2.1, 12.2.5, 12.2.4		
RAMP_LOSS	Character	Sections 12.2.1, 12.2.2		
REVERSE	Logical	Section 12.2.1		F
ROUGHNESS	Real	Section 12.2.1	m	0.0
SPEC_ID	Char. Array	Section 12.2.5		
TAU_AC	Real	Section 12.2.6	s	1.0
TAU_FAN	Real	Section 12.2.4	s	1.0
TAU_VF	Real	Section 12.2.1	s	1.0
TYPE_ID	Character	Section 12.2		
VENT_ID	Character	Section 12.2.3		
VENT2_ID	Character	Section 12.3.2		
VOLUME_FLOW	Real	Section 12.2.1, 12.2.4	m^3/s	
XYZ	Real Triplet	Section 12.2.3	m	0.0

22.12 INIT (Initial Conditions)

Table 22.12: For more information see Section 8.

INIT (Initial Conditions)				
CELL_CENTERED	Logical	Section 17.5.3		F
CROWN_BASE_HEIGHT	Real	Section 19.2.1	m	
CROWN_BASE_WIDTH	Real	Section 19.2.1	m	
CTRL_ID	Character	Section 17.5.3		
DB	Character	Section 8.1		
DENSITY	Real	Section 8.3	kg/m^3	Ambient
DEVC_ID	Character	Section 17.5.3		
DIAMETER	Real	Section 17.5.3	µm	
DT_INSERT	Real	Section 17.5.3	s	
DX	Real	Section 17.5.3	m	0.
DY	Real	Section 17.5.3	m	0.
DZ	Real	Section 17.5.3	m	0.

Table 22.12: Continued

INIT (Initial Conditions)				
HEIGHT	Real	Section 17.5.3	m	
HRRPUV	Real	Section 8.4	kW/m^3	
ID	Character	Section 17.4		
MASS_FRACTION(:)	Real Array	Section 8.1	kg/kg	Ambient
MASS_PER_TIME	Real	Section 17.5.3	kg/s	
MASS_PER_VOLUME	Real	Section 17.5.3	kg/m^3	1
MULT_ID	Character	Section 10.5		
N_PARTICLES	Integer	Section 17.5.3		0
N_PARTICLES_PER_CELL	Integer	Section 17.5.3		0
PACKING_RATIO	Real	Section 19.2		
PART_ID	Character	Section 17.5.3		
PARTICLE_WEIGHT_FACTOR	Real	Section 17.5.3		1.
PATH_RAMP(3)	Character	Section 17.5.3		
RADIATIVE_FRACTION	Real	Section 8.4		0.
RADIUS	Real	Section 17.5.3	m	
RAMP_PART	Character	Section 17.5.3		
RAMP_Q	Character	Section 8.4		
SHAPE	Character	Section 17.5.3		'BLOCK'
SPEC_ID(N)	Character Array	Section 8.1		
TEMPERATURE	Real	Section 8.2	°C	TMPA
TREE_HEIGHT	Real	Section 19.2.1	m	
UNIFORM	Logical	Section 17.5.3		F
UVW(3)	Real Array	Section 17.5.3	m/s	0.
VOLUME_FRACTION(:)	Real Array	Section 8.1	mol/mol	Ambient
XB(6)	Real Array	Section 8.1	m	
XYZ(3)	Real Array	Section 17.5.3	m	

22.13 ISOF (Isosurface Parameters)

Table 22.13: For more information see Section 21.6.

ISOF (Isosurface Parameters)				
DELTA	Real	Section 21.6		
QUANTITY	Character	Section 21.6		
QUANTITY2	Character	Section 21.6		
SKIP	Character	Section 21.6		
SPEC_ID	Character	Section 21.6		
SPEC_ID2	Character	Section 21.6		
VALUE(:)	Real Array	Section 21.6		
VELO_INDEX	Integer	Section 21.10.22		0
VELO_INDEX2	Integer	Section 21.10.22		0

22.14 MATL (Material Properties)

Table 22.14: For more information see Section 11.3.

MATL (Material Properties)				
A(:)	Real Array	Section 11.5	1/s	
ABSORPTION_COEFFICIENT	Real	Section 11.3.2	1/m	50000.
ALLOW_SHRINKING	Logical	Section 11.5.3		T
ALLOW_SWELLING	Logical	Section 11.5.3		T
BETA_CHAR(:)	Real Array	Section 19.1	kg/kg	0.2
BOILING_TEMPERATURE	Real	Section 11.5.7	°C	5000.
CONDUCTIVITY	Real	Section 11.3.2	W/(m·K)	0.
CONDUCTIVITY_RAMP	Character	Section 11.3.2		
DENSITY	Real	Section 11.3.2	kg/m^3	0.
DIFFUSIVITY_SPEC(:)	Real	Section 11.5.9	m^2/2	
E(:)	Real Array	Section 11.5	J/mol	
EMISSIVITY	Real	Section 11.3.2		0.9
GAS_DIFFUSION_DEPTH(:)	Real Array	Section 11.5	m	0.001
HEATING_RATE(:)	Real Array	Section 11.5	°C/min	5.
HEAT_OF_COMBUSTION(:,:)	Real Array	Section 11.5	kJ/kg	
HEAT_OF_REACTION(:)	Real Array	Section 11.5	kJ/kg	0.
HEAT_OF_REACTION_RAMP(:)	Char. Array	Section 13.2		
ID	Character	Section 11.1		
MATL_ID(:,:)	Character	Section 11.5		
MAX_REACTION_RATE(:)	Real Array	Section 11.5.2		∞
MW	Real	Section 11.5.7	g/mol	
N_O2(:)	Real Array	Section 11.5		0.
N_REACTIONS	Integer	Section 11.5		0
N_S(:)	Real Array	Section 11.5		1.
N_T(:)	Real Array	Section 11.5		0.
NU_MATL(:,:)	Real Array	Section 11.5	kg/kg	0.
NU_O2_CHAR(:)	Real Array	Section 19.1	kg/kg	0.
NU_PART(:,:)	Real Array	Section 11.5	kg/kg	0.
NU_SPEC(:,:)	Real Array	Section 11.5	kg/kg	0.
PART_ID(:,:)	Char. Array	Section 11.5		
PCR(:)	Logical Array	Section 11.5		F
PYROLYSIS_RANGE(:)	Real Array	Section 11.5.2	°C	80.
REFERENCE_RATE(:)	Real Array	Section 11.5	1/s	
REFERENCE_TEMPERATURE(:)	Real Array	Section 11.5	°C	
REFRACTIVE_INDEX	Real	Section 11.3.9		1.
SPECIFIC_HEAT	Real	Section 11.3.2	kJ/(kg·K)	0.
SPECIFIC_HEAT_RAMP	Character	Section 11.3.2		
SPEC_ID(:,:)	Char. Array	Section 11.5		
THRESHOLD_SIGN(:)	Real Array	Section 11.5		1.0
THRESHOLD_TEMPERATURE(:)	Real Array	Section 11.5	°C	-273.15

22.15 MESH (Mesh Parameters)

Table 22.15: For more information see Section 6.3.

MESH (Mesh Parameters)				
CHECK_MESH_ALIGNMENT	Logical	Section 6.3.4		F
COLOR	Character	Section 6.3.3		'BLACK'
CYLINDRICAL	Logical	Section 6.3.2		F
IJK	Integer Triplet	Section 6.3.1		10,10,10
LEVEL	Integer	For future use		0
MPI_PROCESS	Integer	Section 6.3.3		
MULT_ID	Character	Section 10.5		
N_THREADS	Integer	Section 6.3.3		
RGB	Integer Triplet	Section 6.3.3		0,0,0
TRNX_ID	Character	Section 6.3.5		
TRNY_ID	Character	Section 6.3.5		
TRNZ_ID	Character	Section 6.3.5		
XB(6)	Real Sextuplet	Section 6.3.1	m	0,1,0,1,0,1

22.16 MISC (Miscellaneous Parameters)

Table 22.16: For more information see Section 7.

MISC (Miscellaneous Parameters)				
AEROSOL_SCRUBBING	Logical	Section 15.6		F
AGGLOMERATION	Logical	Section 15.5		T
ALIGNMENT_TOLERANCE	Real	Section 6.3.4		0.001
ALLOW_SURFACE_PARTICLES	Logical	Section 17.7.1		T
ALLOW_UNDERSIDE_PARTICLES	Logical	Section 17.7.1		F
ASSUMED_GAS_TEMPERATURE	Real	Section 11.6	°C	
ASSUMED_GAS_TEMPERATURE_RAMP	Character	Section 11.6		
BNDF_DEFAULT	Logical	Section 21.5		T
C_DEARDORFF	Real	Section 7.5		0.1
CFL_MAX	Real	Section 7.6.1		1.0
CFL_MIN	Real	Section 7.6.1		0.8
CFL_VELOCITY_NORM	Integer	Section 7.6.1		
CHECK_HT	Logical	Section 7.6.4		F
CHECK_VN	Logical	Section 7.6.2		T
CNF_CUTOFF	Real	Section 17.3.3		0.005
CONSTANT_SPECIFIC_HEAT_RATIO	Logical	Section 14.1.3		F
C_SMAGORINSKY	Real	Section 7.5		0.20
C_VREMAN	Real	Section 7.5		0.07
C_WALE	Real	Section 7.5		0.60
DEPOSITION	Logical	Section 15.4		T

Table 22.16: Continued

MISC (Miscellaneous Parameters)				
FLUX_LIMITER	Integer	Section 7.7		2
FREEZE_VELOCITY	Logical	Section 7.10		F
GAMMA	Real	Section 14.1.2		1.4
GRAVITATIONAL_DEPOSITION	Logical	Section 15.4		T
GRAVITATIONAL_SETTLING	Logical	Section 15.4		T
GVEC(3)	Real Array	Section 7.4	m/s^2	0,0,-9.81
H_F_REFERENCE_TEMPERATURE	Real	Section 21.10.23	°C	25.
HUMIDITY	Real	Section 14.1.1	%	40.
HVAC_LOCAL_PRESSURE	Logical	Section 12.2	T	
HVAC_MASS_TRANSPORT	Logical	Section 12.2.8		F
HVAC_PRES_RELAX	Real	Section 12.2		0.5
IBLANK_SMV	Logical	Section 21.4		T
I_MAX_TEMP	Integer	Section 7.11.1	K	5000
LEVEL_SET_ELLIPSE	Logical	Section 19.5		T
LEVEL_SET_MODE	Integer	Section 19.5		0
MAXIMUM_VISIBILITY	Real	Section 21.10.4	m	30
MAX_LEAK_PATHS	Integer	Section 12.3.2		200
MINIMUM_FILM_THICKNESS	Real	Section 17.7.1	m	0.00001
MPI_TIMEOUT	Real	Section 21.10.24	s	10.
NOISE	Logical	Section 7.8		T
NOISE_VELOCITY	Real	Section 7.8	m/s	0.005
NORTH_BEARING	Real	Section 19.5.2	deg.	
ORIGIN_LAT	Real	Section 19.5.2	deg.	
ORIGIN_LON	Real	Section 19.5.2	deg.	
OVERWRITE	Logical	Section 7.9		T
PARTICLE_CFL	Logical	Section 7.6.3		F
PARTICLE_CFL_MAX	Real	Section 7.6.3		1.0
PARTICLE_CFL_MIN	Real	Section 7.6.3		0.8
POROUS_FLOOR	Logical	Section 17.6		T
PR	Real	Section 7.5		0.5
P_INF	Real	Section 7.1	Pa	101325
RAMP_GX	Character	Section 7.4		
RAMP_GY	Character	Section 7.4		
RAMP_GZ	Character	Section 7.4		
RESTART	Logical	Section 7.3		F
RESTART_CHID	Character	Section 7.3		CHID
SC	Real	Section 7.5		0.5
SHARED_FILE_SYSTEM	Logical	Section 6.3.3		T
SIMULATION_MODE	Character	Section 7.2		'VLES'
SMOKE_ALBEDO	Real	Reference [2]		0.3
SOLID_PHASE_ONLY	Logical	Section 11.6		F
SOOT_DENSITY	Real	Section 15.4		1800
SOOT_OXIDATION	Logical	Section 15.4		F

Table 22.16: Continued

MISC (Miscellaneous Parameters)				
TAU_DEFAULT	Real	Section 13.1	s	1.
TERRAIN_IMAGE	Character	Section 21.10.18		
TEXTURE_ORIGIN(3)	Real Triplet	Section 10.4.2	m	(0.,0.,0.)
THERMOPHORETIC_DEPOSITION	Logical	Section 15.4		T
THERMOPHORETIC_SETTLING	Logical	Section 15.4		T
THICKEN_OBSTRUCTIONS	Logical	Section 10.2.1		F
TMPA	Real	Section 7.1	°C	20.
TURBULENCE_MODEL	Character	Section 7.5		'DEARDORFF'
TURBULENT_DEPOSITION	Logical	Section 15.4		T
VERBOSE	Logical	Section 6.3.3		
VISIBILITY_FACTOR	Real	Section 21.10.4		3
VN_MAX	Real	Section 7.6.2		1.0
VN_MIN	Real	Section 7.6.2		0.8
Y_CO2_INFTY	Real	Section 15.1.1	kg/kg	
Y_O2_INFTY	Real	Section 15.1.1	kg/kg	

22.17 MOVE (Coordinate Transformation Parameters)

Table 22.17: For more information see Section 13.4.

MOVE (Coordinate Transformation Parameters)				
AXIS(3)	Real Array	Axis of rotation		(0.,0.,1.)
SCALE	Real	Scaling in all directions		1.
SCALEX	Real	Scaling in the unrotated x direction		1.
SCALEY	Real	Scaling in the unrotated y direction		1.
SCALEZ	Real	Scaling in the unrotated z direction		1.
DX	Real	Translation in the x direction	m	0.
DY	Real	Translation in the y direction	m	0.
DZ	Real	Translation in the z direction	m	0.
ID	Character	Identification tag		
ROTATION_ANGLE	Real	Angle of rotation about AXIS	deg.	0.
T34	Real Array	3×4 Transformation Matrix		0.
X0	Real	x origin	m	0.
Y0	Real	y origin	m	0.
Z0	Real	z origin	m	0.

22.18 MULT (Multiplier Function Parameters)

Table 22.18: For more information see Section 10.5.

MULT (Multiplier Function Parameters)				
DX	Real	Spacing in the x direction	m	0.
DXB(6)	Real Array	Spacing for all 6 coordinates	m	0.
DX0	Real	Translation in the x direction	m	0.
DY	Real	Spacing in the y direction	m	0.
DY0	Real	Translation in the y direction	m	0.
DZ	Real	Spacing in the z direction	m	0.
DZ0	Real	Translation in the z direction	m	0.
ID	Character	Identification tag		
I_LOWER	Integer	Lower array bound, x direction		0
I_LOWER_SKIP	Integer	Lower array bound begin skip, x direction		
I_UPPER	Integer	Upper array bound, x direction		0
I_UPPER_SKIP	Integer	Upper array bound end skip, x direction		
J_LOWER	Integer	Lower array bound, y direction		0
J_LOWER_SKIP	Integer	Lower array bound begin skip, y direction		
J_UPPER	Integer	Upper array bound, y direction		0
J_UPPER_SKIP	Integer	Upper array bound end skip, y direction		
K_LOWER	Integer	Lower array bound, z direction		0
K_LOWER_SKIP	Integer	Lower array bound begin skip, z direction		
K_UPPER	Integer	Upper array bound, z direction		0
K_UPPER_SKIP	Integer	Upper array bound end skip, z direction		
N_LOWER	Integer	Lower sequence bound		0
N_LOWER_SKIP	Integer	Lower sequence bound begin skip		
N_UPPER	Integer	Upper sequence bound		0
N_UPPER_SKIP	Integer	Upper sequence bound end skip		

22.19 OBST (Obstruction Parameters)

Table 22.19: For more information see Section 10.2.

OBST (Obstruction Parameters)				
ALLOW_VENT	Logical	Section 10.2.1		T
BNDF_FACE(-3:3)	Logical Array	Section 21.5		T
BNDF_OBST	Logical	Section 21.5		T
BULK_DENSITY	Real	Section 11.5.8	kg/m^3	
COLOR	Character	Section 10.2.1		
CTRL_ID	Character	Section 20.4.2		
DEVC_ID	Character	Section 20.4.2		
HEIGHT	Real	Section 10.5.2	m	
HT3D	Logical	Section 11.3.9		F
ID	Character	Section 10.2.1		
INTERNAL_HEAT_SOURCE	Real	Section 11.3.9	kW/m^3	
LENGTH	Real	Section 10.5.2	m	

Table 22.19: Continued

OBST (Obstruction Parameters)				
MATL_ID	Character	Section 11.3.9		
MULT_ID	Character	Section 10.5		
ORIENTATION(3)	Real Array	Section 10.5.2	m	(0.,0.,1.)
OUTLINE	Logical	Section 10.2.1		F
OVERLAY	Logical	Section 10.2.1		T
PERMIT_HOLE	Logical	Section 10.2.7		T
PROP_ID	Character	Reference [2]		
PYRO3D_IOR	Integer	Section 11.5.9		0
PYRO3D_MASS_TRANSPORT	Logical	Section 11.5.9		F
RADIUS	Real	Section 10.5.2	m	
RAMP_Q	Character	Section 11.3.9		
REMOVABLE	Logical	Section 10.2.7		T
RGB(3)	Integer Array	Section 10.2.1		
SHAPE	Character	Section 10.5.2		
SURF_ID	Character	Section 10.2.1		
SURF_ID6(6)	Char. Array	Section 10.2.1		
SURF_IDS(3)	Char. Array	Section 10.2.1		
TEXTURE_ORIGIN(3)	Real Array	Section 10.4.2	m	(0.,0.,0.)
THETA	Real	Section 10.5.2	deg.	
THICKEN	Logical	Section 10.2.1		F
TRANSPARENCY	Real	Section 10.2.1		1
WIDTH	Real	Section 10.5.2	m	
XB(6)	Real Array	Section 10.2.1	m	
XYZ(3)	Real Array	Section 10.5.2	m	(0.,0.,0.)

22.20 PART (Lagrangian Particles/Droplets)

Table 22.20: For more information see Chapter 17.

PART (Lagrangian Particles/Droplets)				
ADHERE_TO_SOLID	Integer	Section 17.4.5		0
AGE	Real	Section 21.9	s	1×10^5
BREAKUP	Logical	Section 17.3.4		F
BREAKUP_CNF_RAMP_ID	Character	Section 17.3.4		
BREAKUP_DISTRIBUTION	Character	Section 17.3.4		'ROSIN...'
BREAKUP_GAMMA_D	Real	Section 17.3.4		2.4
BREAKUP_RATIO	Real	Section 17.3.4		3/7
BREAKUP_SIGMA_D	Real	Section 17.3.4		
CHECK_DISTRIBUTION	Logical	Section 17.3.3		F
CNF_RAMP_ID	Character	Section 17.3.3		
COLOR	Character	Section 21.9		'BLACK'
COMPLEX_REFRACTIVE_INDEX	Real	Section 17.3.2		0.01

Table 22.20: Continued

PART (Lagrangian Particles/Droplets)				
CTRL_ID	Character	Section 17.5.1		
DENSE_VOLUME_FRACTION	Real	Section 17.3.5		1×10^{-5}
DEVC_ID	Character	Section 17.5.1		
DIAMETER	Real	Section 17.3.3	μm	
DISTRIBUTION	Character	Section 17.3.3		'ROSIN...'
DRAG_COEFFICIENT(3)	Real Array	Section 17.4.2		
DRAG_LAW	Character	Section 17.4.2		'SPHERE'
FREE_AREA_FRACTION	Real	Section 17.4.9		
GAMMA_D	Real	Section 17.3.3		2.4
HEAT_OF_COMBUSTION	Real	Section 17.3.1	kJ/kg	
HEAT_TRANSFER_COEFFICIENT_GAS	Real	Section 17.3.1	W/m^2/K	
HEAT_TRANSFER_COEFFICIENT_SOLID	Real	Section 17.7.1	W/m^2/K	300
HORIZONTAL_VELOCITY	Real	Section 17.7.1	m/s	0.2
ID	Character	Section 17.1		
INITIAL_TEMPERATURE	Real	Section 17.3.1	°C	TMPA
KILL_DIAMETER	Real	Section 17.3.3	μm	
MASSLESS	Logical	Section 17.2		F
MASS_TRANSFER_COEFFICIENT	Real	Section 17.3.1	m/s	
MAXIMUM_DIAMETER	Real	Section 17.3.3	μm	1000000
MINIMUM_DIAMETER	Real	Section 17.3.3	μm	
MONODISPERSE	Logical	Section 17.3.3		F
N_STRATA	Integer	Section 17.3.3		6
ORIENTATION(1:3,:)	Real Array	Section 17.4		
PERMEABILITY(3)	Real Array	Section 17.4.8		
POROUS_VOLUME_FRACTION	Real	Section 17.4.8		
PROP_ID	Character	Section 17.1		
QUANTITIES(10)	Character	Section 21.9		
QUANTITIES_SPEC_ID(10)	Character	Section 21.9		
RADIATIVE_PROPERTY_TABLE	Real	Section 17.3.2		
REAL_REFRACTIVE_INDEX	Real	Section 17.3.2		1.33
RGB(3)	Integers	Section 21.9		
RUNNING_AVERAGE_FACTOR	Real	Section 17.3.2		0.5
RUNNING_AVERAGE_FACTOR_WALL	Real	Section 17.3.2		0.5
SAMPLING_FACTOR	Integer	Section 21.9		1
SHAPE_FACTOR	Real	Section 19.2		0.25
SIGMA_D	Real	Section 17.3.3		
SPEC_ID	Character	Section 17.3.1		
STATIC	Logical	Section 17.4		F
SURFACE_DIAMETER	Real	Section 17.7.1	μm	1000.
SURFACE_TENSION	Real	Section 17.3.4	N/m	7.28×10^{-2}
SURF_ID	Character	Section 17.4		
TURBULENT_DISPERSION	Logical	Section 17.2		F
VERTICAL_VELOCITY	Real	Section 17.7.1	m/s	0.5

22.21 PRES (Pressure Solver Parameters)

Table 22.21: For more information see Section 9.

PRES (Pressure Solver Parameters)				
BAROCLINIC	Logical	Section 9.2		T
CHECK_POISSON	Logical	Section 9.1		F
FISHPAK_BC(3)	Integer Array	Section 10.3.2		
ITERATION_SUSPEND_FACTOR	Real	Section 9.1	s	0.95
MAX_PRESSURE_ITERATIONS	Integer	Section 9.1		10
PRESSURE_RELAX_TIME	Real	Section 12.3.3	s	1.
PRESSURE_TOLERANCE	Real	Section 9.1	s^{-2}	
RELAXATION_FACTOR	Real	Section 12.3.3		1.
SOLVER	Character	Section 9.1.1		'FFT'
SUSPEND_PRESSURE_ITERATIONS	Logical	Section 9.1		T
TUNNEL_PRECONDITIONER	Logical	Section 9.3		F
VELOCITY_TOLERANCE	Real	Section 9.1	m/s	

22.22 PROF (Wall Profile Parameters)

Table 22.22: For more information see Section 21.3.

PROF (Wall Profile Parameters)				
CELL_CENTERED	Logical	Section 21.3		F
FORMAT_INDEX	Integer	Section 21.3		1
ID	Character	Section 21.3		
INIT_ID	Character	Section 21.3		
IOR	Real	Section 21.3		
QUANTITY	Character	Section 21.3		
XYZ	Real Triplet	Section 21.3	m	

22.23 PROP (Device Properties)

Table 22.23: For more information see Section 20.3.

PROP (Device Properties)				
ACTIVATION_OBSCURATION	Real	Section 20.3.5	%/m	3.24
ACTIVATION_TEMPERATURE	Real	Section 20.3.1	°C	74.
ALPHA_C	Real	Section 20.3.5		1.8
ALPHA_E	Real	Section 20.3.5		0.
BETA_C	Real	Section 20.3.5		1.
BETA_E	Real	Section 20.3.5		1.

Table 22.23: Continued

PROP (Device Properties)				
CHARACTERISTIC_VELOCITY	Real	Section 21.10.19	m/s	1.
C_FACTOR	Real	Section 20.3.1	$(m/s)^{1/2}$	0.
DENSITY	Real	Section 21.10.7	kg/m^3	8908.
DIAMETER	Real	Section 21.10.7	m	0.001
EMISSIVITY	Real	Section 21.10.7		0.85
FED_ACTIVITY	Integer	Section 21.10.16		2
FLOW_RAMP	Character	Section 20.3.1		
FLOW_RATE	Real	Section 20.3.1	L/min	
FLOW_TAU	Real	Section 20.3.1		0.
GAUGE_EMISSIVITY	Real	Section 21.10.11		1.
GAUGE_TEMPERATURE	Real	Section 21.10.11	°C	TMPA
HEAT_TRANSFER_COEFFICIENT	Real	Section 21.10.7	$W/(m^2 \cdot K)$	
HISTOGRAM	Logical	Section 21.10.17		F
HISTOGRAM_CUMULATIVE	Logical	Section 21.10.17		F
HISTOGRAM_LIMITS(2)	Real Array	Section 21.10.17		
HISTOGRAM_NBINS	Integer	Section 21.10.17		10
HISTOGRAM_NORMALIZE	Logical	Section 21.10.17		T
ID	Character	Section 20.3		
INITIAL_TEMPERATURE	Real	Section 20.3.1	°C	TMPA
K_FACTOR	Real	Section 20.3.1	$L/(min \cdot bar^{\frac{1}{2}})$	1.
LENGTH	Real	Section 20.3.5	m	1.8
MASS_FLOW_RATE	Real	Section 20.3.1	kg/s	
OFFSET	Real	Section 20.3.1	m	0.05
OPERATING_PRESSURE	Real	Section 20.3.1	bar	1.
ORIFICE_DIAMETER	Real	Section 20.3.1	m	0.
PARTICLES_PER_SECOND	Integer	Section 20.3.1		5000
PARTICLE_VELOCITY	Real	Section 20.3.1	m/s	0.
PART_ID	Character	Section 20.3.1		
PDPA_END	Real	Section 21.10.14	s	T_END
PDPA_INTEGRATE	Logical	Section 21.10.14		T
PDPA_M	Integer	Section 21.10.14		0
PDPA_N	Integer	Section 21.10.14		0
PDPA_NORMALIZE	Logical	Section 21.10.14		T
PDPA_RADIUS	Real	Section 21.10.14	m	0.
PDPA_START	Real	Section 21.10.14	s	0.
PRESSURE_RAMP	Character	Section 20.3.1		
P0	Real	Section 20.3.3	m/s	0.
PX(3)	Real	Section 20.3.3	m/s	0.
PXX(3,3)	Real	Section 20.3.3	m/s	0.
QUANTITY	Character	Section 20.3.1		
RTI	Real	Section 20.3.1	$\sqrt{m \cdot s}$	100.
SMOKEVIEW_ID(:)	Char. Array	Section 20.7.1		
SMOKEVIEW_PARAMETERS(:)	Char. Array	Section 20.7.2		

Table 22.23: Continued

PROP (Device Properties)				
SPEC_ID	Character	Section 20.3.5		
SPECIFIC_HEAT	Real	Section 21.10.7	kJ/(kg · K)	0.44
SPRAY_ANGLE(2,2)	Real	Section 20.3.1	degrees	60.,75.
SPRAY_PATTERN_BETA	Real	Section 20.3.1	degrees	5.
SPRAY_PATTERN_MU	Real	Section 20.3.1	degrees	0.
SPRAY_PATTERN_SHAPE	Character	Section 20.3.1		'GAUSSIAN'
SPRAY_PATTERN_TABLE	Character	Section 20.3.1		
VELOCITY_COMPONENT	Integer	Section 20.3.3		

22.24 RADF (Radiation Output File Parameters)

Table 22.24: For more information see Section 21.10.13.

RADF (Radiation Output File Parameters)				
I_STEP	Integer	Section 21.10.13		1
J_STEP	Integer	Section 21.10.13		1
K_STEP	Integer	Section 21.10.13		1
XB	Real Sextuplet	Section 21.10.13	m	

22.25 RADI (Radiation Parameters)

Table 22.25: For more information see Section 16.1.

RADI (Radiation Parameters)				
ANGLE_INCREMENT	Integer	Section 16.3		5
BAND_LIMITS	Real Array	Section 16.3.2	μm	
C_MAX	Real	Section 16.1		100
C_MIN	Real	Section 16.1		1
INITIAL_RADIATION_ITERATIONS	Integer	Section 16.2		3
KAPPA0	Real	Section 16.3	1/m	0
MIE_MINIMUM_DIAMETER	Real	Section 16.4	μm	0.5
MIE_MAXIMUM_DIAMETER	Real	Section 16.4	μm	$1.5\times D$
MIE_NDG	Integer	Section 16.4		50
NMIEANG	Integer	Section 16.4		15
NUMBER_RADIATION_ANGLES	Integer	Section 16.2		100
OPTICALLY_THIN	Logical	Section 16.1		F
PATH_LENGTH	Real	Section 16.3.1	m	0.1
QR_CLIP	Real	Section 16.1	kW/m^3	10
RADIATION	Logical	Section 16.1.1		T
RADIATION_ITERATIONS	Integer	Section 16.2		1

Table 22.25: Continued

RADI (Radiation Parameters)				
RADTMP	Real	Section 16.4	°C	900
TIME_STEP_INCREMENT	Integer	Section 16.2		3
WIDE_BAND_MODEL	Logical	Section 16.3.2		F
WSGG_MODEL	Logical	Section 16.3.3		F

22.26 RAMP (Ramp Function Parameters)

Table 22.26: For more information see Chapter 13.

RAMP (Ramp Function Parameters)				
CTRL_ID	Character	Section 20.6.1		
DEVC_ID	Character	Section 20.6.1		
F	Real	Chapter 13		
ID	Character	Chapter 13		
NUMBER_INTERPOLATION_POINTS	Integer	Chapter 13		5000
T	Real	Chapter 13	s (or °C)	
X	Real	Section 7.4	m	
Z	Real	Section 18.1	m	

22.27 REAC (Reaction Parameters)

Table 22.27: For more information see Chapter 15.

REAC (Reaction Parameters)				
A	Real	Section 15.3		
AIT_EXCLUSION_ZONE(6,:)	Real Array	Section 15.1.7	m	
AUTO_IGNITION_TEMPERATURE	Real	Section 15.1.7	°C	-273 °C
C	Real	Section 15.1.1		0
CHECK_ATOM_BALANCE	Logical	Section 15.2		T
CO_YIELD	Real	Section 15.1.1	kg/kg	0
CRITICAL_FLAME_TEMPERATURE	Real	Section 15.1.6	°C	1427
E	Real	Section 15.3	J/mol	
EPUMO2	Real	Section 15.1.2	kJ/kg	13100
EQUATION	Character	Section 15.2.5		
FORMULA	Character	Section 15.1.1		
FUEL	Character	Section 15.1.1		
FUEL_RADCAL_ID	Character	Section 15.1.1		
FWD_ID	Character	Section 15.3.2		
H	Real	Section 15.1.1		0
HCN_YIELD	Real	Section 15.1.1	kg/kg	0

Table 22.27: Continued

REAC (Reaction Parameters)				
HEAT_OF_COMBUSTION	Real	Section 15.1.2	kJ/kg	
HOC_COMPLETE	Real	Section 15.1.4	kJ/kg	
ID	Character	Section 15.1.1		
IDEAL	Logical	Section 15.1.1		F
LOWER_OXYGEN_LIMIT	Real	Section 15.1.6	mol/mol	
N	Real	Section 15.1.1		0
NU(:)	Real Array	Section 15.3		
N_S(:)	Real Array	Section 15.3		
N_T	Real	Section 15.3		
O	Real	Section 15.1.1		0
PRIORITY	Integer	Section 15.2.3		1
RADIATIVE_FRACTION	Real	Section 16.1		
RAMP_CHI_R	Character	Section 16.1		
REAC_ATOM_ERROR	Real	Section 15.2	atoms	1.E-5
REAC_MASS_ERROR	Real	Section 15.2	kg/kg	1.E-4
REVERSE	Logical	Section 15.3.2		F
SOOT_H_FRACTION	Real	Section 15.1.1		0.1
SOOT_YIELD	Real	Section 15.1.1	kg/kg	0.0
SPEC_ID_N_S(:)	Char. Array	Section 15.3		
SPEC_ID_NU(:)	Char. Array	Section 15.3		
THIRD_BODY	Logical	Section 15.3		F

22.28 SLCF (Slice File Parameters)

Table 22.28: For more information see Section 21.4.

SLCF (Slice File Parameters)				
AGL_SLICE	Real	Section 21.10.18	m	
CELL_CENTERED	Logical	Section 21.4		F
DB	Character	Section 21.4		
ID	Character	Section 21.4		
MAXIMUM_VALUE	Real	Reference [2]		
MESH_NUMBER	Integer	Section 21.4		
MINIMUM_VALUE	Real	Reference [2]		
PART_ID	Character	Section 21.12		
PBX, PBY, PBZ	Real	Section 21.4	m	
PROP_ID	Character	Section 21.10.16		
QUANTITY	Character	Section 21.12		
QUANTITY2	Character	Section 21.12		
REAC_ID	Character	See QUANTITY='HRRPUV REAC'		
SPEC_ID	Character	Section 21.12		
VECTOR	Logical	Section 21.4		F

Table 22.28: Continued

SLCF (Slice File Parameters)				
VELO_INDEX	Integer	Section 21.10.22		0
XB(6)	Real Array	Section 21.4	m	

22.29 SM3D (Smoke3D Parameters)

Table 22.29: For more information see Section 21.8.

SM3D (Smoke3D Parameters)				
QUANTITY	Character	Section 21.8		
SPEC_ID	Character	Section 21.8		

22.30 SPEC (Species Parameters)

Table 22.30: For more information see Section 14.

SPEC (Species Parameters)				
AEROSOL	Logical	Section 15.4		F
BACKGROUND	Logical	Section 14		F
BETA_LIQUID	Real	Section 17.3.1	1/K	
CONDUCTIVITY	Real	Section 14.1.2	W/(m·K)	
CONDUCTIVITY_LIQUID	Real	Section 17.3.1	W/(m·K)	
CONDUCTIVITY_SOLID	Real	Section 15.4	W/(m·K)	0.26
COPY_LUMPED	Logical	Section 14.2		F
DENSITY_LIQUID	Real	Section 17.3.1	kg/m^3	
DENSITY_SOLID	Real	Section 15.4	kg/m^3	1800.
DIFFUSIVITY	Real	Section 14.1.2	m^2/s	
ENTHALPY_OF_FORMATION	Real	Section 17.3.1	kJ/mol	
EPSILONKLJ	Real	Section 14.1.2		0
FIC_CONCENTRATION	Real	Section 21.10.16	ppm	0.
FLD_LETHAL_DOSE	Real	Section 21.10.16	ppm×min	0.
FORMULA	Character	Section 14.1.2		
HEAT_OF_VAPORIZATION	Real	Section 17.3.1	kJ/kg	
H_V_REFERENCE_TEMPERATURE	Real	Section 17.3.1	°C	
ID	Character	Section 14.1.1		
LUMPED_COMPONENT_ONLY	Logical	Section 14.2		F
MASS_EXTINCTION_COEFFICIENT	Real	Section 20.3.5		0
MASS_FRACTION(:)	Real Array	Section 14.2		0
MASS_FRACTION_0	Real	Section 14.1.1		0
MASS_FRACTION_COND_0	Real	Section 15.7		0
MAX_DIAMETER	Real	Section 15.5	m	

Table 22.30: Continued

SPEC (Species Parameters)				
MEAN_DIAMETER	Real	Section 15.4	m	
MELTING_TEMPERATURE	Real	Section 17.3.1	°C	
MIN_DIAMETER	Real	Section 15.5	m	
MW	Real	Section 14.1.2	g/mol	29.
N_BINS	Integer	Section 15.5		
PR_GAS	Real	Section 14.1.2		PR
PRIMITIVE	Logical	Section 14.1.2		
RADCAL_ID	Character	Section 14.1.5		
RAMP_CP	Character	Section 14.1.2		
RAMP_CP_L	Character	Section 17.3.1		
RAMP_D	Character	Section 14.1.2		
RAMP_G_F	Character	Section 14.1.2		
RAMP_K	Character	Section 14.1.2		
RAMP_MU	Character	Section 14.1.2		
REFERENCE_ENTHALPY	Real	Section 14.1.2	kJ/kg	
REFERENCE_TEMPERATURE	Real	Section 14.1.2	°C	25.
SIGMALJ	Real	Section 14.1.2		0
SPEC_ID(:)	Char. Array	Section 14.2		
SPECIFIC_HEAT	Real	Section 14.1.2	kJ/(kg·K)	
SPECIFIC_HEAT_LIQUID	Real	Section 17.3.1	kJ/(kg·K)	
THERMOPHORETIC_DIAMETER	Real	Section 15.4	m	
VAPORIZATION_TEMPERATURE	Real	Section 17.3.1	°C	
VISCOSITY	Real	Section 14.1.2	kg/(m·s)	
VISCOSITY_LIQUID	Real	Section 17.3.1	kg/(m·s)	
VOLUME_FRACTION(:)	Real Array	Section 14.2		

22.31 SURF (Surface Properties)

Table 22.31: For more information see Section 10.1.

SURF (Surface Properties)				
ADIABATIC	Logical	Section 11.2.3		F
AREA_MULTIPLIER	Real	Section 11.4.3		1.0
BACKING	Character	Section 11.3.3		'EXPOSED'
BLOWING	Logical	Section 11.2.2		F
BURN_AWAY	Logical	Section 11.5.8		F
BURN_DURATION	Real	Section 11.5.8	s	1000000
CELL_SIZE_FACTOR	Real	Section 11.3.8		1.0
C_FORCED_CONSTANT	Real	Section 11.2.2		0.0
C_FORCED_PR_EXP	Real	Section 11.2.2		0.0
C_FORCED_RE	Real	Section 11.2.2		0.0
C_FORCED_RE_EXP	Real	Section 11.2.2		0.0

Table 22.31: Continued

SURF (Surface Properties)				
C_HORIZONTAL	Real	Section 11.2.2		1.52
C_VERTICAL	Real	Section 11.2.2		1.31
COLOR	Character	Section 10.4		
CONE_HEAT_FLUX	Real	Section 11.4.4	kW/m^2	
CONVECTION_LENGTH_SCALE	Real	Section 11.2.2	m	1.
CONVECTIVE_HEAT_FLUX	Real	Section 11.2.2	kW/m^2	
CONVERT_VOLUME_TO_MASS	Logical	Section 12.1.6		F
DEFAULT	Logical	Section 10.1		F
DELTA_TMP_MAX	Real	Section 11.3.8	°C	10
DRAG_COEFFICIENT	Real	Section 19.3		2.8
DT_INSERT	Real	Section 17.5.1	s	0.01
E_COEFFICIENT	Real	Section 17.7	m^2/(kg · s)	
EMBER_GENERATION_HEIGHT(2)	Real	Section 17.5.1	m	
EMISSIVITY	Real	Section 11.2.2		0.9
EMISSIVITY_BACK	Real	Section 11.3.3		
EXTERNAL_FLUX	Real	Section 11.6	kW/m^2	
EXTINCTION_TEMPERATURE	Real	Section 11.4.4	°C	-273.
FREE_SLIP	Logical	Section 12.1.7		F
GEOMETRY	Character	Section 11.3.7		'CARTESIAN'
HEAT_OF_VAPORIZATION	Real	Section 11.4.4	kJ/kg	
HEAT_TRANSFER_COEFFICIENT	Real	Section 11.2.2	W/(m^2 · K)	
HEAT_TRANSFER_COEFFICIENT_BACK	Real	Section 11.2.2	W/(m^2 · K)	
HEAT_TRANSFER_MODEL	Character	Section 11.2.2		
HRRPUA	Real	Section 11.4.1	kW/m^2	
HT3D	Logical	Section 11.3.9		F
ID	Character	Section 10.1		
IGNITION_TEMPERATURE	Real	Section 11.4.4	°C	5000.
INNER_RADIUS	Real	Section 17.4.1	m	
INTERNAL_HEAT_SOURCE	Real Array	Section 11.3.6	kW/m^3	
LAYER_DIVIDE	Real	Section 11.3.5		N_LAYERS/2
LEAK_PATH	Int. Pair	Section 12.3.2		
LEAK_PATH_ID	Character Pair	Section 12.3.2		
LENGTH	Real	Section 17.4.1	m	
MASS_FLUX(:)	Real Array	Section 12.1.6	kg/(m^2 · s)	
MASS_FLUX_TOTAL	Real	Section 12.1.2	kg/(m^2 · s)	
MASS_FLUX_VAR	Real	Section 12.1.9		
MASS_FRACTION(:)	Real Array	Section 12.1.6		
MASS_TRANSFER_COEFFICIENT	Real	Section 11.5.7	m/s	
MATL_ID(:,:)	Char. Array	Section 11.5		
MATL_MASS_FRACTION(:,:)	Real Array	Section 11.5		
MINIMUM_BURNOUT_TIME	Real	Section 19.3.1	s	1000000
MINIMUM_LAYER_THICKNESS	Real	Section 11.3.8	m	1.E-6
MLRPUA	Real	Section 11.4.1	kg/(m^2 · s)	

Table 22.31: Continued

SURF (Surface Properties)				
MOISTURE_FRACTION(:)	Real Array	Section 19.2		0.
N_LAYER_CELLS_MAX	Integer Array	Section 11.3.8		1000
NEAR_WALL_TURBULENCE_MODEL	Character	Section 7.5		
NEAR_WALL_EDDY_VISCOSITY	Real	Section 7.5	m^2/s	
NET_HEAT_FLUX	Real	Section 11.2.2	kW/m^2	
NO_SLIP	Logical	Section 12.1.7		F
NPPC	Integer	Section 17.5.1		1
PACKING_RATIO(:)	Real Array	Section 19.2		
PARTICLE_EXTRACTION_VELOCITY	Real	Section 17.6	m/s	
PARTICLE_MASS_FLUX	Real	Section 17.5.1	$kg/(m^2 \cdot s)$	
PARTICLE_SURFACE_DENSITY	Real	Section 17.5.1	kg/m^2	
PART_ID	Character	Section 17.5.1		
PLE	Real	Section 18.5		0.3
PROFILE	Character	Section 12.5		
RADIUS	Real	Section 17.4.1	m	
RAMP_EF	Character	Section 13.1		
RAMP_MF(:)	Character	Section 13.1		
RAMP_PART	Character	Section 13.1		
RAMP_Q	Character	Section 13.1		
RAMP_T	Character	Section 13.1		
RAMP_T_B	Character	Section 11.3.4		
RAMP_T_I	Character	Section 11.3.4		
RAMP_V	Character	Section 13.1		
RAMP_V_X	Character	Section 13.3		
RAMP_V_Y	Character	Section 13.3		
RAMP_V_Z	Character	Section 13.3		
RGB(3)	Integer Array	Section 10.4		255,204,102
ROUGHNESS	Real	Section 12.1.7	m	0.
SHAPE_FACTOR	Real	Section 19.3		0.25
SPEC_ID	Character	Section 12.1.6		
SPREAD_RATE	Real	Section 11.4.2	m/s	
STRETCH_FACTOR(:)	Real	Section 11.3.8		2.
SUBSTEP_POWER	Integer	Section 11.3.8		2
SURFACE_VOLUME_RATIO(:)	Real	Section 19.2	1/m	
TAU_EF	Real	Section 13.1	s	1.
TAU_MF(:)	Real Array	Section 13.1	s	1.
TAU_PART	Real	Section 13.1	s	1.
TAU_Q	Real	Section 13.1	s	1.
TAU_T	Real	Section 13.1	s	1.
TAU_V	Real	Section 13.1	s	1.
TEXTURE_HEIGHT	Real	Section 10.4.2	m	1.
TEXTURE_MAP	Character	Section 10.4.2		
TEXTURE_WIDTH	Real	Section 10.4.2	m	1.

Table 22.31: Continued

SURF (Surface Properties)				
TGA_ANALYSIS	Logical	Section 11.6.2		F
TGA_FINAL_TEMPERATURE	Real	Section 11.6.2	°C	800.
TGA_HEATING_RATE	Real	Section 11.6.2	°C/min	5.
THICKNESS(:)	Real Array	Section 11.1	m	
TMP_BACK	Real	Section 11.3.4	°C	20.
TMP_FRONT	Real	Section 11.2.1	°C	20.
TMP_INNER(:)	Real Array	Section 11.3.4	°C	20.
TRANSPARENCY	Real	Section 10.4		1.
VEG_LSET_BETA	Real	Section 19.5		0.
VEG_LSET_CHAR_FRACTION	Real	Section 19.5		0.2
VEG_LSET_FIREBASE_TIME	Real	Section 19.5	s	
VEG_LSET_FUEL_INDEX	Integer	Section 19.5		
VEG_LSET_HT	Real	Section 19.5		0.
VEG_LSET_IGNITE_TIME	Real	Section 19.5	s	
VEG_LSET_M1	Real	Section 19.5		0.03
VEG_LSET_M10	Real	Section 19.5		0.04
VEG_LSET_M100	Real	Section 19.5		0.05
VEG_LSET_MLW	Real	Section 19.5		0.70
VEG_LSET_MLH	Real	Section 19.5		0.70
VEG_LSET_QCON	Real	Section 19.5	kW/m^2	0.
VEG_LSET_ROS_00	Real	Section 19.5	m/s	0.
VEG_LSET_ROS_BACK	Real	Section 19.5	m/s	0.
VEG_LSET_ROS_FLANK	Real	Section 19.5	m/s	0.
VEG_LSET_ROS_HEAD	Real	Section 19.5	m/s	0.
VEG_LSET_SIGMA	Real	Section 19.5	1/m	0.
VEG_LSET_SURF_LOAD	Real	Section 19.5	kg/m^2	0.3
VEG_LSET_TAN2	Real	Section 19.5		
VEG_LSET_WIND_EXP	Real	Section 19.5		1.
VEL	Real	Section 12.1	m/s	
VEL_BULK	Real	Section 12.5	m/s	
VEL_GRAD	Real	Section 12.1.5	1/s	
VEL_PART	Real	Section 17.5.1	m/s	
VEL_T(2)	Real Array	Section 12.1.4	m/s	
VOLUME_FLOW	Real	Section 12.1	m^3/s	
WIDTH	Real	Section 17.4.1	m	
XYZ(3)	Real Array	Section 11.4.2	m	
Z0	Real	Section 18.5	m	10.
Z_0	Real	Section 11.2.2	m	0.

22.32 TABL (Table Parameters)

Table 22.32: For more information see Section 20.3.1.

TABL (Table Parameters)				
ID	Character	Section 20.3.1		
TABLE_DATA(9)	Real Array	Section 20.3.1		

22.33 TIME (Time Parameters)

Table 22.33: For more information see Section 6.2.

TIME (Time Parameters)				
DT	Real	Section 6.2.2	s	
DT_END_FILL	Real	Section 6.2.2	s	1.0×10^{-6}
DT_END_MINIMUM	Real	Section 6.2.2	s	2.*EPSILON
LIMITING_DT_RATIO	Real	Section 4.2		0.0001
LOCK_TIME_STEP	Logical	Section 6.2.2		F
RESTRICT_TIME_STEP	Logical	Section 6.2.2		T
T_BEGIN	Real	Section 6.2.1	s	0.
T_END	Real	Section 6.2.1	s	1.
TIME_SHRINK_FACTOR	Real	Section 6.2.3		1.
WALL_INCREMENT	Integer	Section 11.3.8		2
WALL_INCREMENT_HT3D	Integer	Section 11.3.9		2

22.34 TRNX, TRNY, TRNZ (MESH Transformations)

Table 22.34: For more information see Section 6.3.5.

TRNX, TRNY, TRNZ (MESH Transformations)				
CC	Real	Section 6.3.5	m	
ID	Character	Section 6.3.5		
IDERIV	Integer	Section 6.3.5		
MESH_NUMBER	Integer	Section 6.3.5		
PC	Real	Section 6.3.5		

22.35 VENT (Vent Parameters)

Table 22.35: For more information see Section 10.3.

VENT (Vent Parameters)				
COLOR	Character	Section 10.4		
CTRL_ID	Character	Section 20.4.2		

Table 22.35: Continued

VENT (Vent Parameters)				
DB	Character	Section 10.3.1		
DEVC_ID	Character	Section 20.4.2		
DYNAMIC_PRESSURE	Real	Section 12.4	Pa	0.
GEOM	Logical	Section 19.5		F
ID	Character	Section 10.3.1		
IOR	Integer	Section 10.3.4		
L_EDDY	Real	Section 12.1.8	m	0.
L_EDDY_IJ(3,3)	Real Array	Section 12.1.8	m	0.
MB	Character	Section 10.3.1		
MULT_ID	Character	Section 10.5		
N_EDDY	Integer	Section 12.1.8		0
OBST_ID	Character	Section 20.4.2		
OUTLINE	Logical	Section 10.3.1		F
PBX, PBY, PBZ	Real	Section 10.3.1		
PRESSURE_RAMP	Character	Section 12.4		
RADIUS	Real	Section 10.3.2	m	
REYNOLDS_STRESS(3,3)	Real Array	Section 12.1.8	m^2/s^2	0.
RGB(3)	Integer Array	Section 10.4		
SPREAD_RATE	Real	Section 11.4.2	m/s	0.05
SURF_ID	Character	Section 10.3.1		'INERT'
TEXTURE_ORIGIN(3)	Real Array	Section 10.4.2	m	(0.,0.,0.)
TMP_EXTERIOR	Real	Section 10.3.2	°C	
TMP_EXTERIOR_RAMP	Character	Section 10.3.2		
TRANSPARENCY	Real	Section 10.4		1.0
UVW(3)	Real Array	Section 12.2.7		
VEL_RMS	Real	Section 12.1.8	m/s	0.
XB(6)	Real Array	Section 10.3.1	m	
XYZ(3)	Real Array	Section 11.4.2	m	

22.36 WIND (Wind and Atmospheric Parameters)

Table 22.36: For more information see Section 18.2.

WIND (Wind and atmospheric parameters)				
CORIOLIS_VECTOR(3)	Real	Section 18.3.2		0.
DIRECTION	Real	Section 18.2	degrees	270
FORCE_VECTOR(3)	Real	Section 18.3.1		0.
GEOSTROPHIC_WIND(2)	Real	Section 18.3.3	m/s	
GROUND_LEVEL	Real	Section 18.5	m	0.
L	Real	Section 18.2	m	0
LAPSE_RATE	Real	Section 18.5	°C/m	0
LATITUDE	Real	Section 18.3.2	degrees	

Table 22.36: Continued

WIND (Wind and atmospheric parameters)				
POTENTIAL_TEMPERATURE_CORRECTION	Logical	Section 18.5.2		F
RAMP_DIRECTION_T	Character	Section 18.2		
RAMP_DIRECTION_Z	Character	Section 18.2		
RAMP_FVX_T	Character	Section 18.3.1		
RAMP_FVY_T	Character	Section 18.3.1		
RAMP_FVZ_T	Character	Section 18.3.1		
RAMP_SPEED_T	Character	Section 18.1		
RAMP_SPEED_Z	Character	Section 18.1		
RAMP_TMP0_Z	Character	Section 18.5		
RAMP_U0_Z	Character	Section 18.4		
RAMP_V0_Z	Character	Section 18.4		
RAMP_W0_T	Character	Section 18.1		
RAMP_W0_Z	Character	Section 18.4		
SIGMA_THETA	Real	Section 18.1	degrees	
SPEED	Real	Section 18.2	m/s	0.
STRATIFICATION	Logical	Section 18.5		T
TAU_THETA	Real	Section 18.1	s	300
THETA_STAR	Real	Section 18.2	K	
TMP_REF	Real	Section 18.2	°C	TMPA
U_STAR	Real	Section 18.2	m/s	
U0,V0,W0	Reals	Section 18.2	m/s	0.
USE_ATMOSPHERIC_INTERPOLATION	Logical	FDS Tech Guide [3]		T
Z_0	Real	Section 18.2	m	0.03
Z_REF	Real	Section 18.2	m	2.

22.37 ZONE (Pressure Zone Parameters)

Table 22.37: For more information see Section 12.3.

ZONE (Pressure Zone Parameters)				
ID	Character	Section 12.3.1		
LEAK_AREA(N)	Real	Section 12.3.2	m^2	0
LEAK_PRESSURE_EXPONENT(N)	Real	Section 12.3.2		0.5
LEAK_REFERENCE_PRESSURE(N)	Real	Section 12.3.2	Pa	4
XYZ(3,:)	Real Array	Section 12.3.1	m	