Parameters used to validate the fully coupled model in Validation Study 1

	Parameter	Unit	Value
Solid fuel	Height	m	0.02
	Dry fuel density	kg m^{-3}	593
	Surface area-to-volume ratio	m^{-1}	4550
	Packing ratio	-	0.058
	Pre-exponential factor (A_{pyr})	s^{-1}	36,400
	Activation energy (E_{pyr})	$Jmol^{-1}$	60,276
	Heat of pyrolysis (ΔH_{pyr})	kJ kg^{-1}	418
	Mass fraction of dry fuel converted to char	-	0.18
Moisture	Fuel moisture content (for constant FMC case only)	m^{-1}	0.065
	Heat of vaporization of water(ΔH_{vap})	kJ kg^{-1}	2259
Char	Density	kg m^{-3}	300
	Thermal conductivity	$Wm^{-1}K^{-1}$	0.05
	Specific heat (As a function of temperature T)	kJ $kg^{-1}K^{-1}$	0.42 + 0.002 T + (6.85 $\times 10^{-7}$) T^2
	Pre-exponential factor (A_{char})	m s^{-1}	430
	Activation energy (E_{char})	$Jmol^{-1}$	-12,000
	Heat of formation (ΔH_{char})	kJ kg^{-1}	
	Mass fraction of char converted to ash	-	0.2
	Mass fraction of oxygen	-	1.65
Ash	Density	kg m^{-3}	67
	Thermal conductivity	$Wm^{-1}K^{-1}$	0.1
	Specific heat (As a function of temperature T)	kJ $kg^{-1}K^{-1}$	$1.244(T/300)^{0.315}$
Soot	Density	kg m^{-3}	1800
	Thermal conductivity	$Wm^{-1}K^{-1}$	0.55
	Specific heat	kJ $kg^{-1}K^{-1}$	2.1