

1 Variables

2 root

	var	symbol	documentation	type	units	eqs
10	$F_{N,A}$	F	basic directed graph incidence matrix	network		
5	t^o	to	time zero	frame	s	3
7	Δt	t_interval	time interval	frame	s	5
6	t^e	te	time end	frame	s	4
9	Δ	pulse	pulse of length time interval	frame		7
4	t	t	time	frame	s	
2	1	one	numerical one	constant		1
3	0	zero	numerical value zero	constant		2
1	#	value	numerical value	constant		
8	0.5	onehalf	numerical one half	constant		6

3 physical

	var	symbol	documentation	type	units	eqs
14	r_{zN}	r_z	z-direction	frame	m	10
12	r_{xN}	r_x	x-direction	frame	m	8
11	l_N	l	length	frame	m	
13	r_{yN}	r_y	y-direction	frame	m	9
17	S_N	S	fundamental state - entropy	state	$kg\,m^2\,K^{-1}\,s^{-2}$	
25	C_N	C	fundamental state - charge	state	$A\,s$	
16	U_N	U	fundamental state - internal energy	state	$kg\,m^2\,s^{-2}$	
15	V_N	V	fundamental state - volume	state	m^3	11
18	$n_{N,S}$	n	fundamental state - molar mass	state	mol	
23	A_N	A	Helmholts energy	state	$kg\,m^2\,s^{-2}$	17
24	G_N	G	Gibbs free energy	state	$kg\,m^2\,s^{-2}$	18
22	H_N	H	Enthalpy	state	$kg\,m^2\,s^{-2}$	15
21	$\mu_{N,S}$	chemPot	chemical potential	effort	$kg\,m^2\,mol^{-1}\,s^{-2}$	14
19	T_N	T	temperature	effort	K	16
20	p_N	p	pressure	effort	$kg\,m^{-1}\,s^{-2}$	13

4 macroscopic-material

	var	symbol	documentation	type	units	eqs
27	$_n$	n	link variable n to interface macroscopic »> material	get	<i>mol</i>	19

5 Equations

6 Generic

no	equation	documentation	layer
1	$1 := \text{Instantiate}(\#, \#)$	numerical one	root
2	$0 := \text{Instantiate}(\#, \#)$	numerical value zero	root
3	$t^o := \text{Instantiate}(t, 0)$	time zero	root
4	$t^e := \text{Instantiate}(t, \#)$	time end	root
5	$\Delta t := \text{Instantiate}(t, \#)$	time interval	root
6	$0.5 := \text{Instantiate}(\#, \#)$	numerical one half	root
7	$\Delta := \text{sign}(t - t^o) - \text{sign}(t - (t^o - \Delta t))$	pulse of length time interval	root
8	$r_{xN} := \text{Instantiate}(l_N, \#)$	x-direction	physical
9	$r_{yN} := \text{Instantiate}(l_N, \#)$	y-direction	physical
10	$r_{zN} := \text{Instantiate}(l_N, \#)$	z-direction	physical
11	$V_N := r_{xN} \cdot r_{yN} \cdot r_{zN}$	volume	physical
13	$p_N := \frac{\partial U_N}{\partial V_N}$	pressure	physical
14	$\mu_{N,S} := \frac{\partial U_N}{\partial n_{N,S}}$	chemical potential	physical
15	$H_N := U_N - p_N \cdot V_N$	Enthalpy	physical
16	$T_N := \frac{\partial U_N}{\partial S_N}$	temperature	physical
17	$A_N := U_N - T_N \cdot S_N$	Helmholts energy	physical

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no	equation	documentation	layer
18	$G_N := U_N + p_N \cdot V_N - T_N \cdot S_N$	Gibbs free energy	physical

7 Interface Link Equation

no	equation	documentation	layer
19	$_n_{N,S} := n_{N,S}$	interface equation	macroscopic material \rightarrow