

1 Specify a temperature schedule (curing)

The CEMHYD3D cement hydration model can be executed under one of three thermal conditions: isothermal, adiabatic, or user-programmed temperature schedule. This menu selection is used to specify a controlled temperature schedule to be used throughout the hydration process. Clicking on the submenu entry generates a form shown in Figure 1. If the user is planning to cure under isothermal or adiabatic conditions only, then this step can be skipped.

1.1 Temperature schedule file name

A name either of a new file or an existing temperature schedule file, to which additional data are to be appended, should be entered here.

1.2 Status of file

The user may indicate whether the file is (1) created as a new file or (2) opened as an existing file for appending the new data. In previous versions of VCCTL, the user was limited to six separate temperature ramps or dwell periods. In Version 1.1 the user may append new data to an existing file, which effectively removes all constraints on the number of separate entries in a temperature schedule.

Create Temperature Schedule File

Temperature schedule file name:

This is a new file
 Append data to this file

Note that the starting and ending times should define a piecewise continuous curve (e.g., starting time (i+1) should equal ending time (i)).

t_{begin} (h)	t_{end} (h)	T_{begin} (°C)	T_{end} (°C)
<input type="text" value="0.0"/>	<input type="text" value="4.0"/>	<input type="text" value="25.0"/>	<input type="text" value="25.0"/>
<input type="text" value="4.0"/>	<input type="text" value="5.0"/>	<input type="text" value="25.0"/>	<input type="text" value="60.0"/>
<input type="text" value="5.0"/>	<input type="text" value="29.0"/>	<input type="text" value="60.0"/>	<input type="text" value="60.0"/>
<input type="text" value="29.0"/>	<input type="text" value="40.0"/>	<input type="text" value="60.0"/>	<input type="text" value="25.0"/>
<input type="text" value="40.0"/>	<input type="text" value="1000.0"/>	<input type="text" value="25.0"/>	<input type="text" value="25.0"/>
<input type="text" value="1000.0"/>	<input type="text" value="40000.0"/>	<input type="text" value="25.0"/>	<input type="text" value="25.0"/>

Figure 1: Form for specifying a programmed temperature schedule for controlled curing.

1.3 Data table

The user may specify up to six separate temperature ramps or dwell periods in the table. Each ramp or dwell period is represented by a linear segment in a piecewise-continuous function of temperature versus time. The user simply indicates the starting and ending times and the starting and ending temperatures for each segment, which uniquely specifies the slope of that segment (dwell periods have the same starting and ending temperatures, and so by definition have zero slope). For any segment i , the ending time $t_{i,f}$ is forced to equal the beginning time, $t_{i+1,0}$, of segment $i + 1$.

References