**The SL model:** The SL (Solid/Liquid) model is the simplest of all material models and

can be used for incompressible working substances, mostly pure solids and pure

liquids. When a block of copper is heated or water is pumped by a centrifugal pump, the SL model can be used for property evaluation of the working substance.

**Assumptions:** All state equations for the SL model are derived from the following basic

assumptions:

1. Specific volume  (and, hence, density ) is a constant, that is, the working substance is incompressible.
2. Specific heat  is a constant (this is actually a corollary to the first

assumption).

If we consider a metal block, it expands when heated; however, the same block, when

idealized by the SL model, must be considered incompressible. Table A-1 and A-2 list material properties of several common solids and liquids s. In the SL-state daemon, specific heats and specific volumes are populated as soon as a working substance is selected.

**SL model equations:** (Constant values of  and are read from tables)

 ;  (1)

  (2)

  (3)

**General state equations:** (Applies to any substance)

 ; ; ; ; ; ;  (4)

 ; ; ;  (5)

 ; ; ;  (6)

 ; ;  (7)

**Reference:** Chapter 1 introduces the concept of states and properties, Chapter 3 covers various material models and state evaluation, and Chapter 11 introduces advanced concepts on property evaluation. Read more about the SL model in Sec. 3.3.