$\varepsilon(t) = p \ln(t/1 \text{ day}) + \varepsilon_1$ is found by the least square method and shown for each load level. p and ε_1 are regression constants. Test data from the fourth RH cycle were used to find the exponential functions. Furthermore, the density of the CFI related to the volume of the CFI for which the creep has reached equilibrium as a function of the applied stress is shown. From the exponential equation describing strain as a function of time and RH cycles, a period of 175 days corresponding to 25 RH cycles was chosen to represent the strain for which creep has reached equilibrium for these experiments. From these assumptions the density for volume-stable state of CFI as a function of the stress is calculated. By the least square method $k^{\mathrm{RH_L/RH_U},n}$ and $\rho_{v-s,0}^{\mathrm{RH_L/RH_U},n}$ are found, $k^{50/80,25} = 0.0677\,\mathrm{kg/Nm}$ and $\rho_{v-s,0}^{50/80,25} = 52.95\,\mathrm{kg/m^3}$.

PREDICTION OF VOLUME STABILITY

The density of CFI required to prevent settling in a wall cavity made of gypsum boards 2.4 m high, 0.2–0.5 m thick and 1.0 m wide was determined. The coefficient of friction between the wall and CFI, and the horizontal stress ratio for CFI was 0.66 and 0.42, respectively, see (Rasmussen, 2002a). The required density was found for the wall cavity exposed to three different climates: (1) the wall was exposed to 23°C and 50% RH; (2) the wall was exposed to 23°C and 80% RH; and (3) the wall was exposed to 23°C and alternately 50 and 80% RH. Results are shown in Figure 4.

In the case where the wall cavity was in a stable environment at 23°C and 50% RH, the density necessary to avoid settling of the CFI was found using

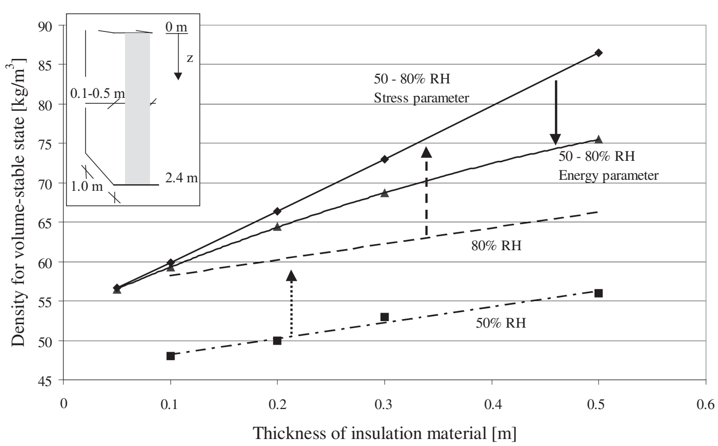

Figure 4. *Calculated necessary density as a function of wall thickness to prevent settling of CFI in a wall cavity with wood studs and gypsum board.*