

Convective Cooling Curves

3.044 February 18, 2005

- Convective cooling curves (dimensional analysis)
- Newtonian Cooling

Mechanics:

- Wulff Lecture February 24 4 PM
- TA for this week: Jorge Vieyra
- Problem set 2 due date...

Materials Societies

(Inter)national organizations which promote sharing and advancement of knowledge.

Benefits: news magazine, conference discount, local chapter meetings

- Minerals, Metals, Materials Society, www.tms.org \
- ASM International www.asminternational.org } \$25/yr
- American Ceramics Society www.acers.org /
- Material Advantage www.materialadvantage.org (all three)

- Materials Research Society, www.mrs.org \$15/yr
- Society for the Advancement of Materials and Process Engineering www.sampe.org
- American Welding Society www.aws.org

Convective Cooling Curves

Through dimensional analysis, we simplified:

$$T - T_{fl} = f(t, r, R, T_i - T_{fl}, h, k, \rho c_p)$$

to the dimensionless:

$$\frac{T - T_{fl}}{T_i - T_{fl}} = f\left(\frac{r}{R}, \frac{\alpha t}{R^2}, \frac{hR}{k}\right)$$

In practical terms:

