

## Homework 1

**Assigned:** Thursday, 09/07

**Due:** Thursday, 09/28

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1. (5%) In the process of clink production, during what temperature range raw materials start to agglomerate?
2. (5%) In the process of clink production, above what temperature liquid phase is formed in the clinker?
3. (5%) How does the presence of water in concrete affect the compressive strength of concrete? Why?
4. (5%) Compare the maximum particle sizes of Portland cement Type I, silica fume, and fly ash.
5. (5%) What is the role of gypsum in cement?
6. (5%) What is the governing/chemical equation in the production of ettringite?
7. (20%) *Concrete* by S. Mindess, J.F. Young and D. Darwin [MYD], 2<sup>nd</sup> ed., Problem 3.1
8. (5%) [MYD], Problem 3.8
9. (5%) [MYD], Problem 3.10
10. (10%) [MYD], Problem 4.1
11. (10%) [MYD], Problem 4.2
12. (10%) [MYD], Problem 4.5
13. (10%) [MYD], Problem 4.9