



ACI SPRING 2005 CONVENTION  
STUDENT “CONCRETE CYLINDER” COMPETITION  
APRIL 17, 2005 – NEW YORK, NY  
RULES (PAGE 1 of 2)



### 1.) Eligibility

- a.) Participants must be college undergraduate students enrolled in an engineering-related program.
- b.) Each school is limited to one team, but there is no limit regarding the number of students on a team.
- c.) A faculty advisor shall supervise and enforce the contest rules.
- d.) For entry in the competition, a registration form must be received by February 18, 2005.

### 2.) Objectives

- a.) To design and produce concrete with the following properties
  - a. **3,500 pounds per square inch (psi)** target 28-day compressive strength
  - b. **115.0 pounds per cubic foot (pcf)** target saturated surface-dry density
  - c. high compressive strength to cementitious content (**psi/(pounds per cubic yard)**)
    - i. cementitious material includes portland cement, fly ash, slag cement and silica fume
  - d. low cost (**\$/cubic yard**)
    - i. 3,000 psi minimum compressive strength is required to qualify for an award
- b.) To prepare and submit a brief summary report describing the rationale used to accomplish the previously listed objectives.

### 3.) Materials

- a.) The concrete mix shall include some or all of the following ingredients conforming to the standards listed in parentheses:
  - a. Aggregates (ASTM C 33 and C 330)
  - b. Chemical Admixtures (ASTM C 260, C 494 or C 1017)
  - c. Fibers (ASTM C 116)
  - d. Supplementary Cementitious Material (ASTM C 618, C 989 and C 1240)
  - e. Portland Cement (ASTM C150)
  - f. Water (ASTM C 191)

### 4.) Specimen Preparation

- a.) The plastic concrete shall exhibit the following properties:
  - a. Slump: 6 inches  $\pm$  2 inches
  - b. Air Content: 6.0 percent  $\pm$  1.5 percent
- b.) The procedures of ASTM C 31 for casting and curing of cylindrical specimens shall be followed.
- c.) The standard specimen shall be a cylinder with a 4” diameter and 8” length.
- d.) The official entry cylinders shall not be cast earlier than 28 days before the test date.

### 5.) Document and Specimen Submission

- a.) The “Official Information Form” and a brief (2-page) summary report or poster board must be submitted by April 9, 2005 to Professor Hani H. Nassif at Rutgers University 623 Bowser Rd. Piscataway, NJ 08854-8014. The documents and test specimens will not be returned.



ACI SPRING 2005 CONVENTION  
STUDENT “CONCRETE CYLINDER” COMPETITION  
APRIL 17, 2005 – NEW YORK NY  
RULES (PAGE 2 of 2)



**6.) Testing**

- a.) Each entry shall consist of two companion cylinders. The competition will be held at the Hilton New York on April 17, at 2:00 PM.
- b.) The strength of the two companion cylinders shall be determined according ASTM C 39.
- c.) The saturate surface-dry (ssd) density shall be determined by the following calculation:
  - a. **[SSD Weight / (SSD Weight – Submerged Weight)] x 62.4**

**7.) Judging**

- a.) Representatives of the NJ Chapter ACI and/or the CIB of New York shall determine compliance with the contest rules. Entries that violate the contest rules will be disqualified.

**8.) Scoring**

- a.) Deviation from following values will be used to calculate scores:
  - a. target strength (**dts**)
  - b. target saturated surface-dry density (**dtd**)
  - c. highest compressive strength to cementitious content (psi/#) (**dpsi/#**)
  - d. lowest cost (\$/cubic yard) (**dlc**)
  - e. best summary report (**drpt**)
- b.) The following formula will be used to determine the overall score:
  - a. **(dpsi/#\*10.0) + (dlc\*3.0) + (dts\*0.1) + (dtd\*20.0) + (drpt)**

*Please refer to the Official Information Form – Page 2 for detailed information about the point system.*

**9.) Prizes**

- a.) The teams that accumulate the least points shall be determined the winners. In the event of a tie, the relevant prize shall be shared equally.
- b.) The following awards shall be given to the sponsoring student association (for example, ASCE), as listed on the “Registration Form”, of the winning schools:

|                     | <b>Strength</b> | <b>Density</b> | <b>Efficiency</b> | <b>Cost</b> | <b>Overall</b> |
|---------------------|-----------------|----------------|-------------------|-------------|----------------|
| <b>First Place</b>  | \$300           | \$300          | \$300             | \$300       | \$300          |
| <b>Second Place</b> | \$200           | \$200          | \$200             | \$200       | \$200          |
| <b>Third Place</b>  | \$100           | \$100          | \$100             | \$100       | \$100          |

**10.) For additional information, please contact:**

- a.) A bulletin board related to the competition will be posted on the NJ Chapter ACI website at [www.njaci.com](http://www.njaci.com). Questions that are received by Friday will be answered by the following Friday.
- b.) Tom Ament  
Euclid Chemical  
(908) 507-6643 (phone)  
[tament66@msn.com](mailto:tament66@msn.com) (e-mail)