

Concrete Bowling Rules

Concrete Bowling combines design, engineering abilities, and your skills on the alley!

Judging of the competition will be based on durability, aesthetics, and bowling skills!

Participation

- Each team shall consist of 2 to 4 students.
- All participants must be registered attendees of the symposium.
- There shall be one team per bowling ball, and there may be more than one team (and bowling ball) from one school.
- Each bowling ball is a separate entrant in the competition and must have a full team (of 2 to 4 students). No students may be on more than one team.
- If there is more than one team (ball) from a school, the teams (balls) shall be identified as [Name of school] Team 1, [Name of School] Team 2, etc.

Bowling Rules

- Standard bowling rules will apply to the bowling portion of the competition.
- Each team will bowl 4 frames, for a maximum of 9 rolls (in case of a spare or strike in the last frame).
- Standard bowling pins will be used, and the alley will be Masonite with wood wall gutters.
- In the case of a tie, the higher aesthetics score will break the tie.

Design and Construction Rules

- The bowling balls may not be less than 7 inches in diameter, nor greater than 9 inches in diameter.
- The weight of the ball shall not exceed 18 pounds.
- The ball must be roughly spherical in shape.
- No resin or epoxy may be used.
- The major constituent of the ball (at least 60%) must be hydraulic (i.e., Portland) cement. No pre-packaged or pre mixed cement may be used.

- Reinforcement, such as metallic or non-metallic reinforcing mesh, may be used. Then reinforcement must not be seen in the ball in its original condition (i.e., before it is rolled the first time). That is, no reinforcement can be exposed when the ball is in its original condition. Exposure as a result of breakage during the competition is allowed.
- The mix design is at the discretion of the ball's creators! Be creative: this is an engineering competition!

Presentation

- Each team must submit a poster with dimensions no greater than 24" x 36" at the competition
- The poster must identify
 - School name (any commonly used name as long as it can not be confused with another school at symposium)
 - Mix design
 - Construction materials and techniques
- The aesthetics of the bowling ball and posters will be judged by professionals. Just as beauty is in the eye of the beholder, so is aesthetics. The judges' determination may not be disputed.

Scoring

- Durability (60 points)
 - After each roll, the largest piece of the bowling ball (by weight) shall be used for the next roll
 - A damaged ball must be able to roll to the pins (no throwing). If the ball can not be rolled, it is disqualified.

$$Durability = \left(\frac{Weight\ of\ largest\ piece\ remaining}{Weight\ of\ ball\ before\ rolling} \right) \times 60$$

Aesthetics (20 points)

- Aesthetics of the ball and poster shall be judged at the beginning of the competition; the specifics left to the discretion of each judge.

Bowling Score (120 points)

- Standard bowling rules will apply. Each bowling frame will have a maximum score of 30 points, for each possible total score of 120 points for all four frames.

Category	Points	Percentage
Durability	60	30
Aesthetics	20	10
Bowling Score	120	60
Sum	200	100