

University of South Alabama Civil Engineering Department

Rules and Regulations For Sand Filter Competition



Presented by the Student Chapter of the American Society of Civil Engineers
at the University of South Alabama
for the USA-ASCE High School Competition
Rules Updated September 2022.

Requirements

Within two hours, construct a sand filter to treat (purify) pond water, based on water turbidity.

Design your own sand filter

Design a sand filter to optimize the turbidity (cleanliness of water) measured by nephelometric turbidity units (NTU). A box of materials will be distributed to your school with all components needed to build the sand filter inside. You may use any combination of the provided materials to build your filter. Once the box is opened, you have two hours to construct your filter. The filter will then be brought back to

The University of South Alabama's campus to be tested for efficiency.

Build model sand filter

1. Empty the bottle of water issued
2. Cut off the bottom of the bottle (be careful!)
3. Turn the bottle upside down so the top is now the bottom
4. Put a cotton ball in the bottom
5. Add a coffee filter to the outside and secure with a rubber band
6. Add gravel to just-fill the "conical" section of the inverted bottle
7. Add layers of filtration media such as sand, gravel, etc.

Scoring

Category	Requirements	Points
Largest difference in influent NTU and effluent NTU	First Place (40 points) Second Place (35 points) Third Place (30 points) Nth Place (40-5(N-1) points)	
Lowest Weight	First Place (10 points) Second Place (8 points) Third Place (6 points) Nth Place (10-2(N-1) points)	
Point deductions	First Place (20 points) Second Place (18 points) Third Place (16 points) Nth Place (20-2(N-1) points) *Bonus 10 points for any cylinder reaching 6000psf	