ASME STUDENT DESIGN COMPETITION

We will be returning to IN-PERSON ASME EFx® events in academic year 2022-2023! EFx events will be IN-PERSON, locally organized throughout the world and several EFx events will include our ASME competitions. Please visit the ASME E-Fest website for an updated list of events at https://efests.asme.org/. Events will be added as they are confirmed.

ASME will ALSO continue to host our two signature FULLY virtual events: E-Fest Careers (Nov. 12, 2022) and E-Fest Digital (March 25, 2023).

We encourage students, competitors, and faculty members to take advantage of the learning experiences provided by both our competitions and other digital offerings throughout the year.

Not all EFx events will have every competition available. Check that SDC is available at that event before registering.

Official responses to questions supersede original competition statements as well as any earlier question responses where there is contradiction. The questions are numbered sequentially as responded to, where Answer 1 is the earliest response.

Information about the ASME E-Fests can be found at: efests.asme.org

(Questions will answered about the 2023 ASME SDC until February 1, 2023)

Q&A Update January 11, 2023

Question 7:

- Can secondary power source (battery, capacitor, mechanical) be used to automated expansion of device, given that we would not be using it to propel the device anytime during the run?
- Can we leave a part of the device at unloading platform considering it to be part of payload?
- Can we charge our power sources (AAA battery and additional sources) multiple times during the 15 minutes round using solar and wind energy?
- Will the charging time of power sources using solar and wind energy also be counted in 15 minutes round?

Answer 7:

- Yes, this power source must be separate from the propulsion system. Also see Q&A #3 regarding expansion options.
- No, the entire device must make the trip to the unloading platform and return to the loading area to earn points.
- Yes
- Yes

Question 6:

- Is it possible that we can use circular weights? Are there any dimension limitations to the weights? Is there full freedom for weight design and use?
- Can we have a charged battery on our device for non-propulsion purposes at the initial stage?
- Does the automated dumping system fall under the propulsion segment of the device? Can we use a secondary battery for the automated dumping system?
- Does having no stored energy at the initial stage apply over the batteries used for non-propulsion purposes as well??

Answer 6:

- Yes, no (except weights must fit within the sizing box), yes.
- Yes
- No, automated weight removal is a control function, not propulsion. Teams can use the secondary battery for the weight dumping feature.
- No, the non-propulsion battery may be charged at the start of each stage.

Q&A Update December 15, 2022

Question 5:

- We are allowed to use an additional battery for “control purposes” but “not to propel the vehicle.” I was wondering if steering an unpowered wheel counts as control or propelling? As in, the back wheels are being driven but a singular unpowered front wheel is used to steer. Can the motor steering be powered by the additional battery or should it be powered by the main rechargeable battery?

Answer 5:

- Yes, provided that the battery controlling the unpowered wheel is not connected to the propulsion system (i.e. the battery is incapable to direct energy to the propulsion functions.

Question 4:

- How long is the "sufficient time" [when charging batteries]?
- How does the referee judge that "the devices contain no stored energy to propel the vehicle other than the AAA battery"?
- How do you define the term "no stored energy"? In the case of batteries like LiPo or other batteries, if it is completely discharged, it seems to be unusable. Therefore, it is recommended that the users shouldn't keep the charging level too low.
- In the competition, each vehicle will contain one AAA 800mAh battery + additional battery for control purpose + charged battery from solar/wind source. Is this correct?
- In the case that two teams use the same communication protocol (for example RF), what if the interference happens? What are the judges' actions?

Answer 4:

- Please refer to Answer 3.
- During initial device check-in, teams will be asked to demonstrate that there is no power stored on board when the AAA battery is disengaged from the device at the beginning of the round.
- Fully discharging batteries can be an issue. Teams need to determine energy storage options that will work for this competition.
- All teams will have the same AAA battery, and can provide their own control battery that doesn't propel their device, but the method of energy storage of the collected solar/wind energy is up to the team.
- Please refer to Rule 27. If a judge believes a team intend to interfere with another team, that team will be disqualified from competition. It is in every team's best interest to ensure that their device/controller communication method is secure.

Question 3:

- Will we be provided unlimited charging time during the initial round?
- To confirm batteries will be fully charged at the beginning of a round.
- Do we have to store all the batteries we will use in the sizing box with the robot or just put them in the sizing box for storage?
- Will any additional information be given on the ramp (thickness)?
- Are we allowed to add storage to the unloading zone? (To store liquid for example)
- Are we able to manually activate mechanisms to expand the robot? (For example, removing a pin or undoing a latch?)

Answer 3:

- Each team will be given a new, charged battery at the start of competition check-in. Teams will have more than an hour to confirm that their battery is fully

charged. Similarly, between rounds teams will have more than an hour to recharge.
- Yes
- Everything that is used on your device should be stored in your sizing box, including all batteries. The battery may be disengaged from the robot while in the sizing box for inert storage purposes. However, all batteries must be stored in the sizing box when not in use throughout the duration of the competition.
- This question is unclear. The unloading platform must be empty at the start of the competition, and all deposited weights removed as soon as they are deployed and measured. The unloading zone is shared real estate on the field, so neither the device nor the team may deploy objects other than the weights.
- Related to Rule 7: “Device expansion must occur under its own power – this may involve preloaded springs or weights.” A simple action like pulling a pin may be used to expand the device.

Question 2:

- Is there any standard on the weights that are used? Standards being size, shape, and/or weight.
- Are we able to reset mechanisms manually while in the loading/charging area? (without being deducted any points)
- What is the material/condition of the floor the robot must traverse?

Answer 2:

- Teams may create and use whatever weights best suit their device.
- Teams will be allowed to reorient their devices to be positioned toward the energy sources and load (reload) weights within the loading area, however manual resetting that adds energy is not permitted. Devices must be capable of operating completely under device power, not with force and control directly provided by a team member.
- Devices should be capable of traversing typical flooring: concrete, tile, wood, carpet. The floor will be as level and smooth as possible. See question 1 regarding ramps.

Q&A Update November 22, 2022

Question 1:

- Does a device that catches the wind from the fan and directly uses that wind to propel it count as having wind energy?

- What happens if the weights are automatically unloaded, but then they fall off of the unloading zone?
- How are the ramps and unloading platform going to be manufactured?

Answer 1:

- Devices that are directly propelled by the wing count as having wind energy
- Weights must remain on the unloading platform to count
- The ramps and unloading platform will most likely be fabricated from unfinished wood. They will be relatively smooth, and will meet the dimensions given in the competition rules. Devices should be able to function on a variety of surfaces and reasonable transitions from the ground to the platform.