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# OFFICIAL RULES FOR THE 2024 TULSA ENGINEERING CHALLENGE

*Sponsored by the Tulsa Engineering Foundation*

## PAPER AIRPLANE COMPETITION DISTANCE FLOWN CATEGORY

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### OBJECTIVE

Design, document, fabricate and submit for flight testing a "paper" airplane to demonstrate Distance of Flight.

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### COMPETITION ENTRY REQUIREMENTS

Each registered entrant (individual or team) may submit one (1) aircraft into a fly-off competition for maximum distance flown. **Each registration form must be accompanied by a drawing or sketch and a Design documentation sheet of the aircraft entry submitted.** The design will be physically duplicated by the students utilizing the drawing and as built Design documentation.

**This Design documentation should include, but is not limited to, the names of all team members, name of the aircraft, a list of all materials, approximate quantity of those materials used for the construction of the aircraft, and the process steps for fabrication of the aircraft.** The drawing of the aircraft as configured for flight should include the dimensions of the wing span and the overall length of the aircraft.

**All entries will be verified against the registered Design documents prior to acceptance for flight-testing.**

No entry will be accepted by the configuration judge unless it is accompanied by a Design document with all of the information listed above. If the required information is not present with the submitted aircraft, the configuration judge will return the incomplete design document and the aircraft to the entrant with a list of needed information. The entrant should make the corrections and re-submit the document and the airplane to the configuration judge. Only one re-submission will be allowed. All re-entries will also be verified against the registered Design documents as part of the acceptance for entry into the competition demonstration.

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### MATERIAL OPTIONS

The entrants may use the following materials to construct their aircraft. The entrants may use any amount of the cited materials up to the maximum stated.

**a.** Any amount of paper up to a maximum of 187 square inches. (Note: This is equivalent to a standard sheet of 11x17 paper or two sheets of 8.5x11 papers). It is NOT required that the entire sheet be used and it is not required that the entire airplane be folded from one piece of paper. The paper may be of any weight (tissue, newspaper, gift-wrap, copier paper, aluminum foil, etc.)

up to and including index card or manila folder stock. NO corrugated cardboard, foam board, or poster board is to be used.

**b.** White glue and scotch tape. (To be used for adhesive purposes only. Masses of tape or glue are NOT to be used for added weight.)

**c.** Paper Clips, standard office size (No.1, 1.25 inches long).

**1) HS Division ONLY, limited to 3 paper clips.**

**2) MS Division ONLY, limited to 5 paper clips.**

**3) 6<sup>th</sup> grade and under Division, limited to 6 paper clips.**

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## CONSTRUCTION SPECIFICATIONS

All aircraft are to be folded or built by the student team members only. Materials used in the fabrication of the aircraft are strictly limited to those listed in the Material Options above and as documented in the Design documentation. All aircraft will be identified by a unique name or number as recorded in the Design documentation. The aircraft may be any size or shape excluding disks or saucers. Aircraft may not utilize any spinning motion for stability (such as a Frisbee) or for any other function. The aircraft must demonstrate aerodynamic glider flight. (NO rubber bands or other power sources are permitted. NO crumpled balls of paper or foil "flying" by ballistic inertia are permitted.) The wingspan, which is defined as the largest dimension of the aircraft perpendicular to the intended direction of motion during flight, must be equal to at least half of the overall length of the aircraft. These dimensions must hold true for the in-flight configuration of the aircraft. No part of the aircraft may be deformed by the thrower, by aerodynamic force during flight, or by any other mean, such that the proportional dimensions of the aircraft violate this specification. Special note for foil aircraft: at least one small area of exposed scotch tape should be provided to allow the officials to initial the entry after inspection.

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## COMPETITION SPECIFICATIONS

During all phases of the competition, the decisions of the Officials are FINAL.

### Pre-Test-Flight Activities

The competition will run continuously during the Challenge hours, between 8:30 a.m. & 11:30 a.m. The competition area will be marked and will be off-limits except for the Officials and any special assistants specifically designated by the Officials. Prior to the testing, each competitor shall submit their aircraft and design document to the Officials for inspection. After verifying that the entry complies with the contest Construction Specifications and matches the design document submitted at registration, the inspecting Official will initial the aircraft and place it on the designated staging table or area. Each aircraft shall be registered to and flight-tested for one and only one team. No re-registration, sharing, or trading of planes is allowed. Each team is responsible for visual security of their entry (watching from outside the off-limits area) and for being aware of when it is their aircraft's turn to be tested. No time will be spent looking for or waiting for teams not present when it is their turn. If a team is not present for their turn, that aircraft will be moved to the back end of the staging line (and may be eliminated from the competition by time limitations).

## Test-Flight Sequence

The demonstration phase of the competition will be held in a designated flight range. The range boundaries will be marked on the floor of the competition area. The size of the range will be 15 feet by 100 feet. Each aircraft team will be given the opportunity for two valid throws on the competition range. When it is the teams turn to demonstrate their aircraft, the officials will call them and the team members will be allowed to enter the competition area. An Official (or designated assistant) will move the entry from the staging area to the end of the flight range and give it to the thrower. The team may make any adjustments to the aircraft before the first and/or second flights, provided that the adjustments before each flight do not take more than 1 minute. After 1 minute has passed, an official will instruct the team to throw the aircraft. If it is not thrown immediately, the team will forfeit the throw. No new material may be added to the aircraft during the adjustment period. The aircraft should be sturdy enough to survive a normal flight without needing major repairs. The officials may allow exceptions to this rule if the aircraft requires repairs due to damages caused by special circumstances or if the plane lands somewhere where it cannot be recovered intact.

When the team is ready for the airplane to be thrown, the thrower will stand at the end of the competition area and throw the aircraft. The aircraft must begin flight over the edge of the flight range at a height of at least five feet and no more than six feet from the ground. A small step will be provided for throwers who are not capable of throwing the glider at that height. The height of the throw will be verified by the judges using a visual reference.

An Official (or assistant) down-range will note the position of the aircraft nose when the plane first touches the floor and this will be considered the end-point of the flight. Travel distance on the floor after touchdown is NOT counted. The straight-line distance along the floor, from the start-point under the aircraft's nose to the end-point, will be measured and noted. If the aircraft leaves the 15 by 100 foot area during the flight, the position of the aircraft when it passes the boundary will be estimated by the officials and the distance to that position along the floor will be measured and count as a valid distance.

If the aircraft touches or is interfered with by a spectator (other than the owning team) during flight inside the flight range, that test flight will be declared invalid and will not count against the team's 2 flight maximum.

If the aircraft touches, is aided by, or interfered with by a member of that entry's owning team after the aircraft has been thrown and while it is in the flight range boundaries, that test flight will be considered VALID but a distance of ZERO (0) feet will be noted for that flight.

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## JUDGING AND SCORING

For each entry, the longest valid flight distance will be recorded and the Officials will determine a First, Second, and Third Place winner for each of the three student divisions. When the winners are announced, at the end of the competition, the winning team members need not be present.

Any appeals are to be brought to the attention of the TECh Chair as soon as possible on the day of the competition. The TECh Chair and 2 advisors will collect relevant information from the student and the judges and will make a decision on how to proceed.

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## GENERAL

The contest is limited to four (4) entries per division per school. Each entry may be an individual or a team project, conducted by two students. It is recommended that the bigger participation schools stage run-off competitions on their home campus to select the “varsity teams” to compete at TECh if they have more than 4 potential entries.

Registration will be done via the TECh web page which can be accessed through [www.tulsaengineer.org](http://www.tulsaengineer.org).

Questions may be sent directly to the lead judge at [davsea3@yahoo.com](mailto:davsea3@yahoo.com). Please cc: [tulsatechchallenge@gmail.com](mailto:tulsatechchallenge@gmail.com).

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## PRIZES

Prizes will be awarded for three divisions as follows: Upper Division (9<sup>th</sup> thru 12<sup>th</sup>) for the Middle Division (7<sup>th</sup> thru 8<sup>th</sup>) and Lower Division (6<sup>th</sup> grade and under). In the event of a tie, prizes will be equally distributed between winning entries.

First Place:               \$50 cash and \$25 for their classroom.

Second Place:           \$40 cash and \$25 for their classroom

Third Place:             \$25 cash and \$25 for their classroom.

Cash prizes will be awarded by a bank check and issued to the teacher/school listed on the registration. We will mail a check to the address listed on the registration within a few weeks of the competition. If you do not receive your prize within a few weeks, please email [info@tulsaengineer.org](mailto:info@tulsaengineer.org) with your team name, school, and competition won.