

Q: What are the details for the flag? How is it raised?

A: The flag should be attached to your robot and raised when you return to your home base and would like to end the round. Methods you use to raise it are up to your discretion.

Q: To be clear this means that the flag must be small (less than 3 inches) since the robot is only allowed to extend that far in the process of raising the flag?

A: The flag itself has no dimension restrictions, with the exception of it cannot exceed the dimensions of the robot. The only requirement is that your robot in general stays within the overall robot dimensions described in the rules (9in x 9in x 11in when stationary).

Q: Is there a size requirement for the flag? Can it be an LCD?

A: Any material not prohibited in the rules is allowable. LCD is acceptable as long as it is "raised".

Q: What happens if the robots in the hardware competition collide with each other? How is fault determined?

A: Fault is not assigned unless it is obvious to the judges that a robot intended to cause damage or disturb the progress of the other robot. The required bumpers are intended as safe guards to prevent catastrophic damage to one another's robots. Hopefully the bumpers would prevent any but cosmetic damages.

Q: Does the robot have to remain in constant contact with the playing field (a.k.a can it fly as long as it does not leave the bounds of the arena?)

A: For safety and security reasons it is required that the robot remain in contact with the playing field at all times.

Q: When in motion, can the robot extend 3 inches past the max dimensions or 3 inches past the dimensions of our robot?

A: The robot cannot extend past the maximum dimensions of 9 in x 9 in when in motion. Reason being that extensions should remain within the bumper.

Q: Can the bumper move?

A: The bumper may move so long as it does not exceed the maximum robot dimensions and remains as the outermost part of the robot during motion.

Q: Do the objects count as part of the size requirement? As in, if the robot is holding the object outside of its dimensions in movement, will the object then be considered part of the robot?

A: If the robot is pushing the objects, presumably with the bumper, then they would be considered "free" and therefore external to the robot dimensions. If the robot is retaining the objects, presumably within the bumper, then they would be considered "retained" and therefore a part of the robot dimensions when in motion.

Q: How round are the cube corners supposed to be sanded to?

A: There is no particular degree of rounding for the cubes. This has been a conundrum for the committee for quite some time as we struggled with a specific method to achieve the rounded edges / corners. The goal is simply to reduce as much carpet snag as possible. The rules update will contain new information on some pre-rounded cubes. If you've already purchased or made cubes just try your best to round or chamfer the corners.

Q: How thick should the bumper be?

A: The bumper thickness is up to your discretion, just keep in mind the overall robot dimensions.

Q: What material should the bumper be made of?

A: Materials are up to you, this is the case for everything, the only rule of thumb is: any material not prohibited in the rules is allowable.

Q: What does it mean that the surface of the bumper can be of any shape, but it must have a radius of curvature greater than 1 cm? Having a minimum radius of curvature suggests that [the bumper] should not have corners or edges, is this true?

A: Correct, this means that there should be no sharp edges or corners. This is in hopes of reducing damage, with other robots and/or the playing field, in the event of collision. Let me emphasize one key component of this rule, we will NOT be measuring the degree of curvature. You need only to make sure your robot is not sharp (and by extension damaging to the playing field and/or others).

Q: Is there a minimum thickness for the bumper?

A: There is no minimum thickness for the bumper. It is suggested only that you consider, in the event of collision, [the bumper] should not break or snap.

Q: Is there a cut off on how many times the robot can orbit in counterclockwise motion?

A: There is no limit to the number of orbits. The only cut off is the time constraint.

Q: So, after purchasing the recommended tape and balls, they all match up except for the blue. Are you sure the electric blue is the correct color for the tape and not royal blue?

A: The discrepancy in the blue is intentional. The darker blue that closer matches the ball was too dark and indistinguishable from the carpet.

Q: If the robot is pushing a block and the block bumps the Spacetel, does it count as the robot bumping the Spacetel?

A: A ball debris hitting the spacetel does not count as a collision. A block debris hitting the spacetel does count as a collision, only when in possession of a robot, for a point penalty. The robot hitting the spacetel does count as a collision.

Q: Are points awarded at the end of the match or are they awarded throughout the match?

A: Points are awarded at the end of the match.

Q: For flag raising only, can we exceed the parameters set by the rules or can we not?

A: You cannot exceed the size parameters in the rules at any time. There are two specifications for size, one for in motion and one for at rest. You must comply to these restrictions at all times.

Q: When the scoring section mentions the "debris removed from Zone 2", does that mean that the debris is scored for crossing the orbital line initially or that the debris is out of Zone 2 by the end of the round? Also, is the center structure considered a spacetel?

A: Scoring will be conducted at the end of the round. The center structure is not a spacetel.

Q: how are "orbits" counted? If a bot goes around Zone 2, leaves to go to the corner box, reenters Zone 2, and continues around, is that a full orbit? And how does going clockwise affect this scoring?

A: Orbits need to be complete, referenced to home base, however, they do not need to be continuous. A robot may deviate from orbiting and return to orbiting. Starting CCW changing to CW and continuing CCW is fine, however, there must be a complete circuit not just going back and forth past the home base.

Q: During the competition when two robots are against each other, can the robots take the objectives from other competitors' starting location?

A: Yes

Q: Do the paint specs for wooden blocks correspond to Glidden color chip numbers?

A: No. They are specific color recipes to more accurately match the debris and tape color.

Q: How are debris going to be "randomly" placed on the field? How are they being tossed on the field? (Playoff rounds)

A: The general idea that we're going with is having a set of "layouts" that will then get chosen by roll of a die or perhaps dice (or some such other random determination) before each round. Similar to how FIRST distributes objects on their playing fields for FRC and FTC. The prearranged "layout" will specify which debris objects go in which approximate locations within each quadrant.

Q: Could the other robot place some debris in our home base preventing us from getting back to our home base for the playoff rounds?

A: Accidental placement is unavoidable. The other robot may potentially place debris in your home base, which will actually count points toward your team. Depending on the size of your robot, this may affect your robot to fully enter the home base. It will be up to your robot design to account for any issues that impact completion of your mission.

Q: Are the colors on the center structure (taped) different from the corner posts (painted)? Is says on page 11 near the bottom that the corner posts are covered with colored tape, and says on the same page the paint specs for the wooden cube debris objects and corner posts. Are they painted or taped? Since the pit-balls are not painted or taped, are they a different color from the tape and paint?

A: The center structure, corner posts and cubes will all be painted. The colors, provided in the rules, are matched to the best of our ability to the tape color. The pit balls do not match exactly but are fairly similar in color.

Q: Can randomly placed debris lie on the orbital line, quadrant lines or spacetels?

A: 4. The debris objects will be placed inside the quadrants, not overlapping the orbital line, the quadrant lines or spacetels.

Q: What does the "space inside of orbital line" mean? Is the tape marking the orbital line itself part of Zone 2? (Top of page 4)

A: All area, including the lines separating Zone 1 from Zone 2 is considered to be part of Zone 2.

Q: Is the base border dimension to the inside edge of the tape, or the outside? (Page 4)

A: To the outside edge

Q: Do we have to be in our home base to get points for raising the flag, or can we raise the flag at any point and still get points when returning back to base? (Page 8)

A: The flag should be raised in the home base and that will end the play for the team.

Q: in the head-to-head finals where debris will be moved from Zone 2 into Zone 1 Can either robot collect debris left in Zone 1 and move it to its own home base?

A: Yes

Q: Does that include collecting debris from the opponent's home base (which according to the above is in Zone 1)?

A: Yes

Q: If so, how would such debris be scored? If home bases are excluded from Zone 1 (to protect them from theft), are antipodal bases included as part of Zone 1?

A: Scoring will be conducted at the end of the round. The rules do not protect from theft.

Q: (in general) how will orbits be scored?

A: Sharp eyed judges and if necessary instant replay / video recording. Additional clarification you do not have to follow the orbital line. An orbit is a complete rotation around the center post from the quadrant you start in, around, and back to that same quadrant.

Q: (in general) can the robot move in reverse / clockwise around the field?

A: There is no penalty for clockwise movement but no points will be received for orbits that are NOT CCW

Q: Is the use of eye safe, Class 1 lasers allowed such as the VL53L01X, YDLIDAR or LIDAR-Lite?

A: Yes

Q: To place debris in corner squares, do we have to place debris inside our robot, or can we just push it to its destination?

A: It is up to your design. The rules do not restrict the method.

Q: Once we finish the round at home base with debris on our robot (or by pushing it), do we have to release the debris to score it?

A: Again, this is up to you but no, the debris does not need to be "released".

Q: Can our external bumper rotate as long as it is the outermost structure at all times?

A: Yes, as long as A) the overall size of the robot does not exceed the maximum dimensions and B) the minimum coverage area is maintained.

Q: Is debris placed in home base additional points for each debris?

A: Yes

Q: does this statement "The bumper must present a vertical surface at least 2.54-cm (1") high and cover, at a minimum, the space from 3.81-cm (1 ½") to 6.35-cm (2 ½") above the playing field." mean that the bumper must be within 3.81 cm and 6.35 cm? So the bumper cant be higher than 6.35 cm?

A: The bumper may be higher or lower but must "at a minimum" cover the space from 3.81 to 6.35 cm..

Q: are we allowed to launch the cubes as a projectile?

A: It is up to your design. The rules do not restrict the method, however, if you intend to launch as a projectile your team may be disqualified if it damages the playing field or opposing robot. The rules also restrict using any compressed gas or pyrotechnics.

Q: The wall material specifications in the rules are 1"x12"x8' yet the piece purchased from Home Depot that correlates to the store SKU is actually 0.75"x11.25"x8'. What should the actual dimensions be?

A: The actual size of lumber is smaller than the size designation; this is standard practice. The physical dimensions are 0.75" x 11.25" x 8'

Q: Similar to the last question, the corner posts we got from the rules store SKU gave us a 1.5"x1.5" when the rules specifications show 2"x2"

A: 2"x 2" is what the part / material is called; the actual physical dimensions are 1.5"x1.5"

Q: Can you give a picture of either the painted blocks or the paint colors for us to compare with our paint colors.

A: Follow the paint specifications. Due to illumination and camera specifics, photographs don't always portray the visual appearance, hence a photograph may well be misleading.

Q: The interior dimensions of the arena are listed 8'x8', but with the wall material specified, the arena would be 7'11.25"x7'11.25", what should the arena specifications be?

A: The 8' sides overlap in the corners, as shown in the rules. Therefore, the inside dimension is 7' 11.25" x 7' 11.25"

Q: May we use an infrared LASER on our robot? The LASER's specifications say that it meets "FDA Class I Laser Safety".

A: Yes, provided that the laser that is certified eye safe.

Q: Can the robot move clockwise around the field or is the direction of travel only counter clockwise?

A: You may move clockwise without penalty. Only counter-clockwise orbits will score.

Q: Is there a limit on how many laps the robot can make?

A: No

Q: Can the debris be pushed by the robot?

A: Yes

Q: Once debris is moved out of zone two can the debris be picked up and moved?

A: Yes

Q: Before the round starts, are we allowed to orient the robot how we please? For instance, can we position our robot to face the center tower before the round starts?

A: Yes. Orientation doesn't matter as long as the robot is inside the starting area.