3D Printed Derby 2022

Sponsored by Keene Village Plastics

This year ERRF will have three classes with a stronger focus on the awesome creativeness of our 3d printing makers.
This year we will have a Stock class, a Creatively Fast class and a Concours/Show car class!

The Stock class is a pure racing class based on official BSA rules and has not changed since the 3d derby began in 2018. The Stock class is somewhat rule intense and is listed last below. The Creatively fast class allows you to use your imagination to make your fully or almost fully 3d printed car fast with minimal rules with the exception that the car must work on the track without disturbing other race cars or damaging the track in any way. Lastly the least regulated Concours/Show Car class, no racing for these cars, show off all your maker skills and let those fancy cream puffs shine.

The Concours/Show Car Class Rules

- Cars purposely built for show car class **will not race** on the track, (wouldn't want to get them scuffed up now) and should fit within a 4" wide x 8" long x 4" tall box
- Cars should have working wheels and somewhat resemble a car
- Cars may participate in Show car Class if they do not meet the rules of the other classes (fail to pass tech)
- Other than that, design, 3d print, build and paint them till your masterpiece is ready!
- Makers should focus on creativity
- There will be 3 winners of this class

  #1 People's Choice (all attendees can vote)

  #2 Racers Choice (all participants in the 3d printed derby can vote)

  #3 Grand Prize Judges Choice (several unassociated judges will anonymously vote and have their results tallied to choose the grand champion show car)

The Creatively Fast Class Rules

- All the rules for the Creatively Fast class are centered around having a fully printed car (as much as possible, if not all of the car) that is compatible with the track and can race to the finish without impeding other racers.
- All weight is to be 3dprinted, no paint (lets see those layers), the car must work on the track and fit within the tech dimensions, minimal rules other than that. Nothing mechanical, no added propulsion, nothing but the beauty of 3d printing, and maybe a couple pairs of axles.

- 3D Print all of your car with the exception of axles if need be, and a dry lubricant! That's it!!!

Cars must comply with the following to work on the race track:

- **Weight**: not to exceed 6.0 ounces on a scale accurate to 1/10 ounce. For scales that have more than a single digit beyond the decimal point, the maximum weight is 6.0500000
  Width: The maximum width of the car, including wheels and axles, must not exceed 2-3/4 inches. (69.85mm)
- **Length**: Not to exceed 8 inches
- **Height** not to exceed 3 inches
- **Bottom Clearance**: The distance between the bottom of the wheels and the bottom of the lowest point of the car other than the wheels must be at least 3/8 inch. (9.5mm)
- **Width Between Wheels**: The distance between the innermost edges of the left and right wheels must be at least 1-3/4 inches. (44.5mm)
- **Wheels**: must be printed and not fall apart while racing
  In order to reduce risk of damaging the track surface no part of the car shall contact the track other than the wheels while racing.
  ****Your car must be built to go down the track, all the way, and not interfere with other cars or leave the track or anything on the track at any point, cars that violate this rule will be removed from the race. It is the racers responsibility to ensure the car rests securely against the starting pin when placed in the starting position and is wide enough to trigger electronic finish lines.****

The Stock Class Rules

- GENERAL
  • These rules have been adapted from traditional Pinewood Derby racing rules.
  • A completed car purchased from a third party is not allowed. Racers are strongly encouraged to
  design and 3D print their own entries.
  • The car may not be sent to third party facilities for tuning or other performance enhancements.

- BODY
  The main body structure(chassis) must be 3D printed. Any process/filament/material is fine. Any
  additions must be firmly attached, non-propulsive, and meet the following car size specifications. Car
  must fit into official race measuring box, maximum dimensions are detailed below.
  • Overall Width: not to exceed 2 3/4 inches (69.85 mm)
  • Length: not to exceed 7 inches (177.8mm)
  • Weight: not to exceed 5.0 ounces on a scale accurate to 1/10 ounce. For scales that have
  more than a single digit beyond the decimal point, the maximum weight is 5.0500000
  • Clearance: The wheels are the only part of the car allowed to touch the track.
  • Center rail width: Wheels must clear center guide rails, no less than 1 3⁄4 inches minimum.
  (44.5mm)
  • Car bottom: to clear a filled center rail, the bottom of the car should be no less than 3/8 inch
  from the surface (9.5mm)
  • Wheelbase: the distance between the center of the front and rear wheel must be no less than
  4 inches.
  • Front: the front/leading edge of the car must be no more than 1 inch above the wheel lane of
  the track and be at least 1⁄2 inches wide (12.7mm) at the center of the car. NO NARROW POINTED FRONT ENDS.

• When placed in the starting position, no part of the car may protrude beyond the starting pin.
This rule ensures the car rests securely against the starting pin when placed in the starting
position and is wide enough to trigger electronic finish lines. Another way to say this is no
needle nose cars and no cars with a high front end. The needle nose makes it hard to align for
a straight start and often does not trip the electronic sensor until enough of the car has passed
to cover the hole.
• At least 4 wheels must be attached to the sides of the car body. Each wheel must be attached
to the car's chassis with a legal axle.
• Each attached wheel must not be angled(canted) more than 20 degrees from vertical.
• The front most and rear most wheels must be positioned across the body from one another.
• The complete inside and outside lettering of each wheel must be visible when the wheel is
attached to the body.
One more note… The wooden blocks provided in traditional Derby kits measure:
• 7 x 1.75 x 1.25 inches. (177.8 x 44.45 x 31.75mm) and working within these dimensions is
suggested.
The following items are prohibited:
• Springs
• Starting devices or propellants
• Electronic or lighting devices that interfere with the race electronics.
• Liquids, wet paint, oil, sticky substance, or powders of any kind (other than axle lubrication)
• Glass or excessively fragile parts
• Bearings and or bushings
• Hub caps covering the nail head
• Loose/moving objects on or in the car
Although at least 4 wheels are required, it is not required that all 4 wheels touch the track
surface. It can actually be difficult to get all 4 of the wheel s to touch. Most of the fastest cars

have one front wheel raised slightly and not touching.
The rationale for 4 wheels is that it ensures the car will stay on the track and not slide off the
center rail and collide with another car.
NOTE: Any covering of the interior of the wheel must be transparent(clear) and if using interior
wheel weights there must be a slot that allows for rotating the wheel for interior inspection.
Washers/body treatments to help reduce friction ARE ALLOWED. Washers may be between the
body and the wheel, and the wheel and the axle head.
Body treatments (between chassis and wheel) may be things like sprayed on graphite paint,
Teflon tape, other slippery materials/waxes applied to the body.

- WHEELS
  • Only official BSA wheels are allowed. 3D Printed wheels will not be allowed.
  • All lettering and numbering, both inside and outside of the wheel, must remain complete and
  be visible with the wheel on the car.
  • The fluting, spokes and other markings on the outside wheel area must remain visible.
  (“Fluting” refers to the small bumps on the outside edge of the tread.)
  • The wheel diameter must be no less than 1.16 inches.
  • The tread surface width must be no less than 7.5 mm.
  • The tread surface must be flat and parallel to the wheel bore.
  Therefore, the following
  modifications are prohibited:
  o Rounding of the tread surface
  o Grooving, H cutting, or V cutting the tread surface
  • The following wheel modifications are prohibited:
  o Removing material from the inside tread surface or the inside sidewall surface
  o Drilling holes in the tread, sidewalls, or spoke area
  o Removing material from the sidewalls or spoke
  o Filling wheel tread with any type of material
  o Filling the wheel holes and re-drilling the bore
  The rules permit many wheel modification so long as you observe the dimension limits and

restrictions listed above. Common legal modifications include but are not limited to:
• Truing the tread surface with sandpaper, straight edge, or lathe to correct “out of round”
wheels.
• Truing and shaping the inner edge of the thread surface
• Narrowing the tread surface to 7.5mm to get straight edges
• Applying wheel bore treatments such as polish and wax to smooth the bore.
• Tapping the wheel bore
• Truing and re-coning the tip of the inner hub
• Removing the double step from the outer hub
• Balancing the wheel by adding material such as glue or fingernail polish to the inside of the
wheel
• Adding a transparent cover to the inside of the wheel to reduce air drag

- AXLES
  • Metal axles with a nail head are required with an overall diameter of no less than .084 inches.
  • One-piece axles that extend through the width of the car to support both wheels are not
  allowed.
  • You may use official BSA axles or after-market nail type axles from various vendors.
  • You may also polish and groove the axle provided that the journal portion of the axle (the part
  the wheel rides on) is no less than .084 inches, roughly the same diameter as the original BSA
  nails.

- LUBRICATION
  • Over application of lubricant, which results in excessive shedding onto the track is not allowed.
  • Only dry lubricants are allowed.

- WEIGHTS
  • Weights may be used to bring a car to the maximum allowable weight.

• Interior wheel weights are allowed as long as they allow for inspection of the interior of the
wheels.
Some online vendors sell aftermarket BSA wheels that have been lightened by removing material
from inside the wheel surfaces. These wheels are NOT allowed and are easily recognized at
inspection. Cars with these wheels will NOT be permitted to race. If you plan to use aftermarket
wheels, confirm with the vendor that no weight is removed from inside the wheel.

- RACE DAY
  • Please check in and register your 3D Printed Derby racer at event by time posted/requested
  TBD.
  • Each car must pass inspection by the Official Inspection Committee before it may compete.
  The inspectors will disqualify any car not meeting these rules. While the inspectors' decisions
  are final, every effort will be made to get accommodate all race entrants as best as possible.
  But please remember, inspectors' decisions are final.
  • Every effort will be made to do the inspection without any altering of the car. If we can't verify
  that the wheels have not been lightened due to interior wheel weights, air dams, fenders, or
  other reasons, we will ask YOU to take the wheels off for inspection.
  • After a car has passed inspection, only race officials may handle the car.
  • Cars will be placed on display racks until the time for the competition.
  • After check-in, adjustments are not allowed. Car repairs during the race are not allowed unless
  authorized by the race officials.
  • Once Inspection is PASSED before the race, the car will not be re-inspected after the race.
  • Good sportsmanship and behavior is expected. Race officials may ask anyone not following
  this rule to leave.