SISP Secondary Solar Car Challenge
Pursuit Solar Car Rules and Regulations

Introduction

This solar car pursuit race is designed to test your skills of engineering and photovoltaics. You will need to solve many problems before you have a car ready to race in this event. It will require a team effort plus a range of new skills.

Spirit of the Competition

We ask students to enter the "Spirit of the Competition". We hope students will put new skills they learn along the way to be involved in fair and fun racing. Sharing your knowledge will benefit all students in your class.

The Car

Your car will need to comply with the following:

Standards

The car will be powered by one or two of the 2 volt 700mA solar panels.

The car can have one F18 motor

The car will be constructed wholly by your team.

Will be no wider than 260mm

Must Have

An on off switch – 3 positions (Solar, Off, Battery)

Installed a 2 x AA battery pack without batteries (just for cloudy day)

Minimum of 15mm clearance under the car

A plate measuring 10cm x 2cm with your car name on it as part of the car design and clearly visible.

Must Not have

Batteries or any electronic charge devices. The provision for batteries is only for days when the weather has very low solar strength.

High tech/ large dollar construction technique.

Construction

You can use any materials for the construction of the chassis and wheels. Materials you may wish to consider are corflute, balsa wood, Perspex, and craft board plus 3D plastics and acrylic. It is important to consider weight and size. Wheels can be made from all types of material. The diameter of the wheel has an impact on torque and the 15mm clearance. In this event the guides and steering are important as it is an oval track. No matter what you choose, safety is most important.

There are a number of races you will need to complete to get to the final, so your car has to last. It needs to be durable and well-engineered.

Your Challenge

In this event the track is a continuous loop in the shape of an oval. This means your car will be required to follow the half circle loop at each end of the track. The car guidance will be most important.

The gear ratio will have a large impact on the speed and acceleration of the car. You will need to do some testing for different ratios and wheel size. You may even need to consider the ability to change the gear ratio on the day.

It is a good idea to do some testing in different sunlight with different gear ratios. Remember to record your results.

Scrutineering

Prior to racing all cars need to be checked to establish if they comply with these rules. It is important that you read these rules carefully.

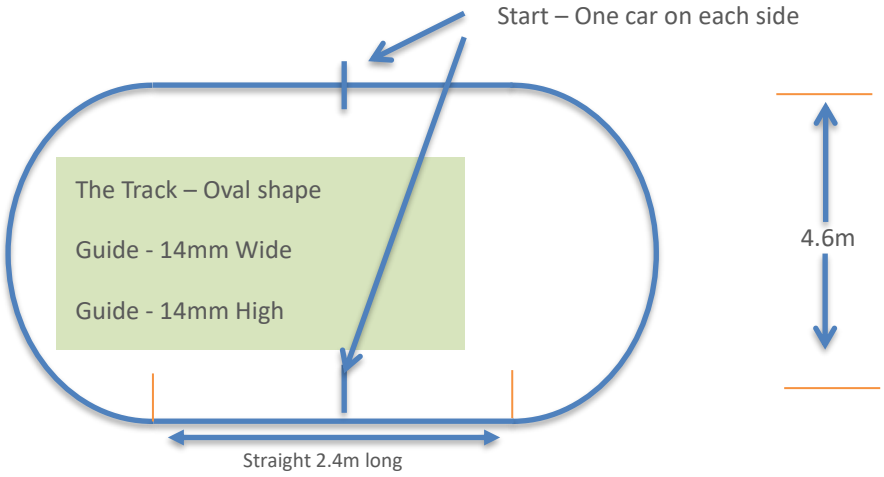
Cars will be checked and then given a race number to be used for calling you to the start of races.

Track

The oval track is made of corflute which is a smooth board. The guide is solid wood and approximately 14mm wide and 14mm high. The track is made up of 6 curve sections at each end. These 6 curves make a half circle and join the straight. Refer to the picture below. The straight section on each side is 2.4m long. The total length of the track is 19.3m

We have done our best to make the joins as clean as possible however there will be some bumps and bulges. You will need to consider this and design your guides to cope with this.

The Track



The Start

Students will be asked to place the car on the track, one on either side. It is important to make sure your guides are correctly lined up with the track. Students will need a cardboard "paddle" to cover the solar panels and then turn the switch to the ON position with the panels covered.

When the cars are ready the starter will call, Ready, Set, Go. The student will lift the cardboard paddle to expose the solar panels to the sun and the race will start. As there is a car on each side of the track facing the same way, the winner is the first car to catch the other. If both cars are the same speed and they look unlikely to catch each other, both will be declared the winner of that race.

Points to consider.

1. The car needs enough power to start from a standing start.
2. The "paddle" needs to fully block the sun so the car will not move at the start line until the "paddle is removed.
3. You need to get the car on and off the track as easily as possible.
4. As this is an oval track the guide system will be important.

The Race

The race is finished when one car catches the other or both are declared winners. In low light it might be the car which travels the greater distance.

The overall event will be a series of heats. The winners move forward to round two, the losers have another series of heats and the winners of these heats move into round two as well.

Round two will be a knockout series of heats. Winners move forward and losers cheer on the winners until we get an overall winner.