National 100m Solar Car rules

for NSW competition

Australian-International Model Solar Car Challenge

2025 Regulations

Contents

These rules are a lift from the National rules and adapted for NSW State competition.

1. INTRODUCTION

1.1. Overview

The Model Solar Car Challenge aims to deliver a hands-on educational experience in the areas of Science, Technology, Engineering and Mathematics.
The event has been designed to provide students with a practical learning experience in designing and building a solar powered vehicle, gain an understanding of the engineering processes involved and recognise the importance of renewable energy for a sustainable future.
Teacher, mentor and parent guidance is strongly encouraged but it's important that students complete all work themselves and are exposed to the full process of taking an idea from a simple sketch to a running vehicle.

1.2. Competitors

The competition is open to entries from schools, other organisations and private individuals in Australia and from overseas. Competitors must be students currently studying up to and including secondary level Year 12.

1.3. Contact and Correspondence

All correspondence should be sent directly to SunSprint at michael.richards@unsw.edu.au

2. INTERPRETATION OF REGULATIONS

The nature of the event is to promote learning and encourage thinking outside the box. Everything in these regulations is open for interpretation but please check with the Committee if uncertain whether an interpretation may give an unfair advantage and be ruled against later on.

3. ENTRIES

3.1. Invitation to Compete in the State 100m National Event

All students up to year 12 are eligible to enter.

3.2. Original Work

Each team must design and build an original model solar vehicle and not simply re-enter a car from a previous year. Commercial components or parts salvaged from a previous car may be used but the chassis and body must be original and be the work of the students alone.

4. COMPETITION ELEMENTS

4.1. Allocation of Points

At the State event we will not award points for the video or knowledge test but teams need to be aware that these will be required if get to the National event

4.3. Engineering Knowledge

Not required but see the AIMSC rules if you are interested in attending the National event.

4.4. Track Type and Racing Format

SunSprint races will take place across two days on a specially constructed track. This will be a 2-lane figure 8, with a low bridge at the crossover point.
A start gate is located on the downhill slope of the figure 8 track and racing typically held over a single lap of approximately 100m in length. The racing format will be decided by the officials and communicated to teams prior to the event. Round robin rounds are typically held on Day 1 and cars then ranked on their performance for the final knockout competition on Day 2. Figure 8 races may be extended from a single lap to two laps in finals.

4.5. Winning Vehicle

On a two lane track the winner shall be determined as the first to cross the finish line. If a car comes off the track at any point during a race then the opposing car shall be deemed the winner. If both cars fail to finish then the one that has travelled farthest will be awarded the win.

If a team believes they have been mistreated, or lost due to an unfair incident or advantage for the opposing team, then they must report this to the marshals immediately after their race. The officials will work together to resolve the issue and return their decision promptly. That decision will be final.

5. SCRUTINEERING

Upon arriving at the event each team must pass through Scrutineering with their vehicle. Each car will be judged according to these rules. Where a car does not meet these rules, the team will be allowed to make the necessary modifications until it complies. A car may not be allowed to race if this isn’t possible.

6. SERVICING

Teams will be provided a designated work area at the event to make modifications and repairs on their car. Teachers, parents and mentors may be permitted in this area or allocated a nearby space from which they can supervise their students for safety. Adults may give guidance and advice at certain times but only students will be allowed to handle and work on their cars during the event.

Modifications of any kind are allowed during the event but must always comply with these regulations in full. Cars may be checked and re-scrutineered at any time to ensure ongoing compliance.

Hazardous substances are strictly prohibited due to Health and Safety Regulations. Any substance classed as hazardous (solvents, liquefied gases, etc.) must be approved by AIMSC personnel before being used during the competition and the team must provide the relevant MSDS.

7. CAR SPECIFICATIONS

7.1. Size Limit

The car must fit in a box, 500mm long, 150mm high and 320mm wide with the solar panel fitted in place. It must always stay within 190mm of the centre of the guide rail to ensure there's no interference with a car in the lane beside or with any timing equipment.

7.2. Source of Power

Teams must provide their own silicon solar array with an active cell area of no more than 450 sq cm. Cars must only operate on the energy provided by this array during the course of a race.

7.3. Solar Array Weight

The solar array must weigh a minimum of 240g either on its own or combined with one additional unit of ballast. These must both be easily removable from the car for weighing and cannot form any part of the car body, rolling chassis, driver's cabin, side panels or include any switches or electronic devices.

7.4. Panel Testing, Power Limit and Temperature Correction

All arrays will be power tested on a lightbox and teams must supply scrutineers with a set of +ve and –ve connections that are easily attached to with a set of crocodile clips. Any panel exceeding 5.5W at standard test conditions (1000 W/m2 irradiance, 1.5 air mass, 25°C) will have a portion of the cells masked off to reduce the power to within ± 0.1W of this limit. A non-contact thermometer will be used during power testing and a temperature correction applied using the following formula:

P corrected (W) = P measured + P measured x 0.004 x (°C measured – 25)

Any team found to have deliberately tampered with official tape after power measurement will be excluded from the event.

7.5. Use of Electronic Devices

Electronics of any kind are allowed however the total capacitance of all circuitry must not exceed 5mF.

7.6. ON/OFF switch

Each car must be fitted with a commercially available ON/OFF switch.

7.7. Motors

Cars may use any type of motor/s but specifications of the make and model must be made available to scrutineers.

7.8. Wheels

Wheels must be at least 2mm wide and have a radius of at least 1mm on the running surface.

7.9. Cargo

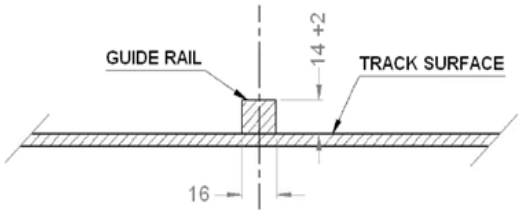
Cars must have an enclosed space capable of fitting at least 20x ping pong balls, each with a nominal diameter of 40mm. This space must retain its shape and cannot have any air pass through with the balls removed for racing. Teams must supply and their car carry an additional 200g of ballast when racing with an electronic device. This must be separate from any solar panel ballast, easily removable from the car and cannot perform any function other than act as ballast.

7.10. Side Panels

Cars must have two rigid side panel areas of at least 150mm long and 50mm high, one on each side, for attaching number stickers that can be easily seen by race marshals and spectators when racing. The curvature over this area can be no more than 20mm horizontally and 10mm vertically.

7.11. Steering

Cars must incorporate a means of steering around the track using the rectangular guide rail at the centre of each lane. This rail will be 16mm wide and 14-16mm high and track curves range from 3.5-5m in radius.



7.12. Driver

Each car must carry a driver to navigate the track. This occupant will be in the form of a 4.5” wooden manakin provided by the team. The driver must sit in a driveable, forward-facing position with a seat belt and 180° vision in the horizontal plane. A clearance of at least 5mm is required to any windscreen.