

Solar Boat Challenge 2008

National event rules and specifications

Divisions.

The National event will have two divisions:

Junior must be less than 13 years of age

Senior. self selected.

Any team with student members 13 years of age or older on 1st October must enter the senior division, and teams with all members less than 13 at that time may elect to contest either division.

All students competing must be enrolled at a school at the time of the event, or being officially home schooled.

Junior Division

Junior Restricted Teams may elect to work to a very specific set of standards, with quite limited choice of parts. This more directed specification, ((the "Junior restricted" group)) is regarded as most suitable for less experienced teams or schools who wish to contain costs.

These teams will be regarded as 'Junior' teams for the Challenge, but will be eligible for special awards for this group. They will thus be competing in the junior category as well as within the "Junior restricted" group.

Senior Division

Teams with any student over 13 on 1st October will be entered in the Senior division. Fewer restrictions apply (motor to the value of \$180, unrestricted propellers, fewer limits on high-tech methods, etc.).

Radio controlled event.

Schools and Students are advised of a new event, **the Radio Controlled race**. This event is being run in conjunction with the Social, Economic and Environmental Sustainability Ltd. (SEES) Group. Their website is

<http://www.solarchallenge.com.au/> A summary of the rules and details for this competition are included at the end of this document.

The radio controlled class will be available to students of any age still at school.

Awarding of prizes.

The emphasis in the event will be on participation and learning, and the chances to participate (even if not a winning entry) will be maximized.

Awards for aspects of designing, making and refining the boats, documenting the steps, and teamwork, will be given. As decided each year, awards such as engineering and construction, teamwork, poster presentation, innovation, teamwork or recycling may be given

Prizes will be awarded for at least the two fastest teams in each division, as a result of points earned in a knock out competition and finals races.

Documenting and describing entries

Although documentation or evidence of the designing, building and refining of vessels, such as in a poster is not an essential component of entry, it is encouraged, and there will be an award for the best entry.

In addition, it is expected that team members will be questioned informally about their entry on scrutineering. It is expected that team members are able to discuss their entry without adult assistance, at a level appropriate to their age.

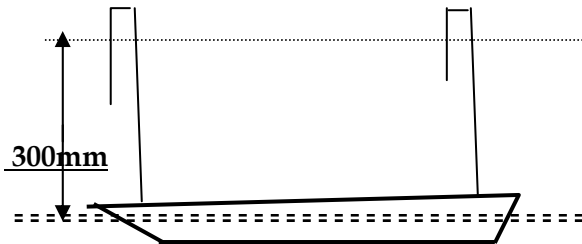
Boat Size.

The maximum size of all boats, including any front or rear projections, is 550mm long by 300mm wide. The boat may be as narrow as desired. It is

suggested that the front of the boat does not end with a point, as this may become caught in starting equipment if it is used.

Guides

To ensure all boats steer in a straight line, they must be fitted with 2 guides (one at each end of the boat) which can be looped over a nylon guide line. The guide line will be stretched as near as possible to 300mm above the water. (See diagram.) The guideline must not be used to propel the boat.



Solar cells

The boat is to be powered by solar cells, up to a maximum of 350 sq.cm of the active photovoltaic cell (s) area. Teams must provide calculations used to confirm the area of solar cells. The outer edges of cells which do not produce electricity need not be included in calculations.

Solar panels must be of a predominantly silicon-based material, and must be available for general purchase by the public.

Rare and difficult to obtain types (such as used in research or satellites) will not be accepted, and substitute cells will be supplied for racing if deemed necessary by the scrutineers.

Teams are asked to supply evidence of the source of the panel if it is not purchased from the Technology Education Centre, Scorpio, Dick Smith or Jaycar.

No storage devices, capacitors or batteries can be used.

Switch

A switch must be installed between the motor and the solar panels, to allow the engine to be turned off easily. The switch may consist of a plug or clip which is removed.

Motors

Junior division: For 2008, teams may use only one motor costing less than \$20. GST does not have to be included. If the motor is not purchased from one of the listed suppliers, teams must provide evidence that the purchase was from an Australian supplier, and that the purchase price was below \$20, exclusive of GST.

The Restricted group may only use a motor of less than \$5, purchased from either: the Technology Education Centre, Scorpio, Dick Smith or Jaycar. The motor may be part of a kit with propeller and shaft, in which case an approximation will be made by the scrutineers of its value.

All junior motors will be accounted for at the new price of the motor, not at a reduced second-hand price.

Senior division: either one motor (valued below \$180), or an unrestricted number of cheap motors (below \$20 each), not counting GST.

Propulsion:

Junior division: restricted to one plastic propeller underwater of 40mm or less, or one propeller in the air. There is no restriction on paddle wheels, oars, etc. An exception will exist if students make their own propeller, in which case no restrictions on material or size apply.

Junior Restricted group: may use only one professional propeller, in kit form, with the shaft, bearing tube and propeller supplied in one set. Propeller to be 30mm. No other form of propulsion can be used.

Senior division: No restriction on propellers, paddles etc.

If propellers are used by either division in the air, like aircraft propellers, no restriction on their size applies, but the whole boat must not exceed the overall size of 300mm X 550mm.

Similarly, if paddle wheels, oars or similar propulsion is used, no size restriction exists for them, provided they fit within the maximum size.

Maximum cost

In some State events, restrictions to a cost for the whole boat apply, such as at the Junior division. (Eg. SA uses a cost of no more than \$65, not counting the solar panels, with team to provide cost details at scrutineering, and may declare recycled materials at “no cost”). At the National level, no overall cost limits apply.

Junior, senior divisions: while no restriction on the cost of the boat applies for these divisions of the National event, a summary of the costs involved would be appreciated by scrutineers and judges for other awards. This may be included in a poster or display if desired.

As stated elsewhere, cost limits apply for motors; (Junior below \$20, or \$5 if “Restricted” group. Senior motors, below \$180, or \$20 if multiple motors used.) GST is not included.

Attaching panels

Panels must be securely attached, so that they cannot fall off in the water.

Exchanging panels

At the National event, teams may share panels with others between races, but can only share a panel between two boats. In the event that two boats sharing a panel are required to race each other (eg. in finals), an alternative panel needs to be supplied.

Students must do the work

Students are to design and construct the boats themselves, though some adult help to improve their skills is acceptable. High level technical work/modifications on Junior division boats (routing, welding, moulding, encapsulation, spray painting, etc) is discouraged, as students will not normally have access to these skills.

All adjustments to the boats, and the launching and retrieval of boats, are to be done by the students themselves and not by adults. If special circumstances require adults to intervene, permission must be sought from the scrutineers or event coordinator.

Boat teams must be available for the boat event

In the event that a school has entries in other events, such as the solar model cars, the entry of a boat requires that a team or team member is available at all times (within reason) to race the vessel.

Hulls

No commercially built hulls may be used.

Entrants from the same school may not have identical hulls, eg. made in the same mould, except where other substantial differences in at least two of the following are incorporated: different cabins, motors, panel attachment or propellers.

Hulls should not be resubmitted for competition if they have competed in a prior event, apart from a State event that year, *unless* significant and substantial modification has occurred, and such modifications are well documented and have the prior approval of the National race coordinator.

Composite(s), vacuum or blow moulded hulls may not be used by Junior division students, and may only be used by Senior division entrants if they have (substantially) participated in making them.

Senior students using vacuum or blow moulded hulls, or other composite hulls, must have designed and made them substantially themselves.

Modification to these rules.

Teams are invited to email suggestions to the National Solar Boat Coordinator, for consideration and consultation at the National event, and for publishing through the National website for feedback from teams.

Suggestions of 'approved suppliers' of motors can be forwarded to the National co-ordinator at any time.

If discrepancies in rules arise, the rules published on the National AIMSC will be deemed to be the correct ones.

Suggested starting equipment

Teams are advised that a paper tag, bearing the number of the boat, will be required on the rear guide post. This will be supplied at scrutineering. At the discretion of the race organiser, this will be the point gripped by students as the boats are released. The tags will be placed to minimise the shadowing of the solar panel.

It has been suggested that at National events, particularly finals, boats are released by an electro-magnetic device to ensure all boats are released at the same time. This will be considered (and if possible, trialled) during 2008 with a view to introducing it in 2009.