

The Evolution of Windsurfing Boards and Rigs

The sport of windsurfing started in Singapore a little more than forty years ago. In that short space of time there have been many changes and improvements to the design and construction of boards and rigs.

Boards

One of the earliest boards, the Dufour Wing (Fig 1) and the Windsurfer (Fig 2) had daggerboards (Fig 2.1) which could not be swung back and retracted into the board. In the case of the Windsurfer, in strong winds when the board became too difficult to control with the daggerboard down, you could pull the daggerboard out of the slot with the strap attached to it and sling it over one arm. The board could then be sailed quite fast with a jet of water shooting out of the daggerboard slot. Alternatively you could buy a specially made short daggerboard called a storm daggerboard for sailing in strong winds.



Fig 1- Dufour Wing



Fig 2 - Windsurfer



Fig 2.1- Original Daggerboard

In the early days the fin at the rear of the board was used mainly to provide directional stability. It was called a skeg. They then realised that if it was properly shaped it worked like a foil to provide sufficient lateral resistance to enable the board to be sailed in stronger winds with the daggerboard retracted. The "skeg" was subsequently referred to as a "fin".

The boards were then made longer with daggerboards which could be swung back into the daggerboard well (Fig 3) . They were designed for course racing and were known as raceboards. These long boards were dominated by manufacturers such as Mistral, F2 and Fanatic and a few others.



Fig 3 – Board with a retractable daggerboard

The Windglider (Fig 4) was such a board but it never became popular in Singapore. It was used in the 1984 Olympics at Los Angeles. Singapore was represented at the Games by the late Kelly Chan, the father of our Kelly Chan Jr.



Fig 4: Windglider

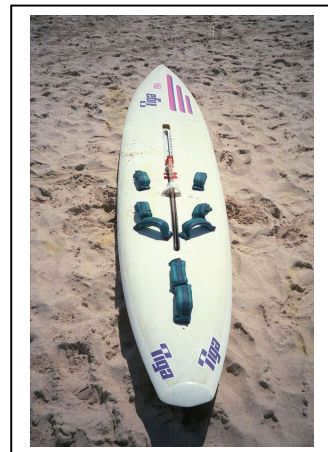


Fig 5: Tiga Funboard

The manufacturers then decided they could make the boards more maneuverable by reducing the overall length and reducing the length and width of the daggerboard. The hull was shaped for early planing. The fin was made longer so the board could be sailed most of the time in stronger winds with the daggerboard retracted. The purpose of these boards was mainly for recreation and were therefore aptly named funboards. A few other manufacturers apart from those mentioned earlier started making their appearance in Singapore. One such was Tiga (Fig 5). Over in Thailand, a new manufacturer under the name of Cobra started producing such boards. They even held international competitions at Pattaya to promote their boards.

A new class of boards was subsequently developed without daggerboards. They were referred to as shortboards (Fig 6) and were to be sailed only in planing conditions when the fins provided sufficient lift to provide the necessary lateral resistance for beam reaching and even for going upwind if the wind was strong enough. In Singapore, competitions for such boards were held at the east coast reclaimed land shoreline at “Lamp post 150”. These were Speed Crossings involving a dash from shore to a beacon out at sea known as Seafix and back to shore. Another popular event was held at Changi beach under sponsorship of Tudor Watches. It was a slalom event with the boards sailing almost parallel to shore providing spectators with an exciting view of the action. Windsurfers from the Professional Windsurfers Association were brought in to raise the profile of the event.



Fig 6 – Shortboards



Fig 7 – 1991 Speed Crossing @ Lamppost 150 T-shirt

About this time, the Division II boards (Fig 8) or what we referred to as “round hulls” came on the scene. Instead of having a flat hull, these boards had rounded hulls much like those of a dinghy. Consequently the volume of the board increased significantly and it could no longer be completely filled with foam. Much of the board was left hollow. This presented a problem because if water entered into the empty space it had to be removed. Therefore the board was provided with a removable bung. Mistral brought out the first Div II board but the idea was soon copied by some people in Penang who designed their own version of this type of board. They named it the Layang Layang and it soon became quite popular with the sailors in Singapore. Course races were run specially for the Layang Layang. There was another entrepreneurial windsurfer in Singapore who decided to manufacture a Swedish designed version of the Div II which was named the Davidson. The Div II board used in the 1988 Olympics was the Swiss made Lechner (Fig 8.1) but this never became popular in Singapore.



Fig 8 – Crit D2



Fig 8.1 – Lechner Round Hull

The next Olympics board was the Mistral One-Design (Fig 9) which was based on the Mistral Equipe. It came with a sail of 7.4 sqm which was considered to be rather small, favouring lighter sailors in most wind conditions. This board was used in three Olympic Games. Because of the small size of the sail, competitors resorted to vigorous pumping (Fig 9.1) which attracted a lot of criticism from the international sailing federation.



Fig 9 – Mistral One-Design (MOD)



Fig 9.1 – MOD pumping

In the meantime, there was a proposal to move away from one design for international competitions and to allow for a free selection of equipment subject to certain rules which limited the dimensions of the board. Under the Formula Windsurfing (Fig 10) rules, the board width was limited to 1 metre and the fin had a maximum length of 70 cm. Competitors had a choice of two sail sizes with the absolute maximum set at 12.5 sqm. This allowed the board to start planing at a lower wind speed. The longer fin enabled the board to go upwind much better (Fig 10.1) . This meant that course racing could be held for this class of boards. Even then, because the board could be used only under planing conditions, it was not practical below a certain wind speed. This class of boards was never adopted for the Olympic Games.



Fig 10 – Formula Board



Fig 10.1 – Riding on the fin to go upwind

Board designers then started looking for a board which could combine the early planing characteristics of the Formula board with the upwind ability of the raceboard. This led to the adoption of the RS-X (Fig 11) from Neil Pryde. It is provided with a retractable daggerboard as well as a long fin. In lighter winds the daggerboard is lowered to improve its upwind capability while in stronger winds it is retracted so it can be sailed at a higher speed in exactly the same way as a Formula board. This became the board of choice for the from the Olympic Games from 2008 to the present day.

In mid 2000, BIC Sport managed to produce a relatively inexpensive and durable board, T293 (Fig 12) for windsurfers under the age of 17. The board is eventually recognized by ISAF as a class status in 2007 and is widely used in most major windsurfing competition for youths.



Fig 11 – RS-X



Fig 12 – Bic T293

Rigs

Masts were originally made of fibreglass. These were durable but lacked stiffness and were very heavy. They were soon replaced with masts made from aluminium alloy which were lighter and stiffer but tended to corrode and break quite easily. Booms were also made of aluminium. Later, they started experimenting with masts made from carbon fibre. These were much lighter and stiffer, however the first such masts broke quite easily. Over time the quality improved and such masts became more durable. Development of such masts went one step further in the production of so-called reduced diameter masts (RDM) which were smaller in overall diameter but had thicker walls. The use of carbon fibre was also adopted for booms.

Sails which originally were made entirely of soft fabric material, mainly polyester were soon made of fabric laminated with a thin layer of plastic material. This enabled them to hold their shape much better. At the same time the sails were provided with full length battens for better stability. Ends nearer the mast were made thinner and more flexible so that the sail could take on a natural draft or camber. It was referred to as a rotating airfoil (RAF) sail. This was followed by the development of camber inducers to force the sail to take on a cambered shape. The stiffer shape of the sail greatly improved its stability. The laminated fabric material soon gave way to transparent monofilm which, like the laminated fabric did not stretch but also did not suffer from delamination.

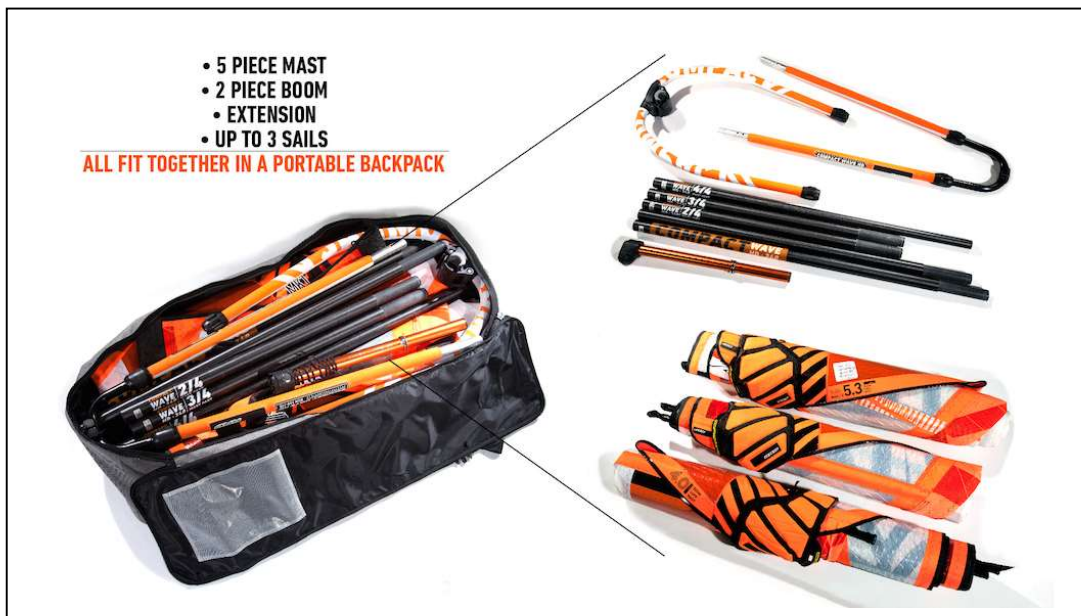


Fig 13 – Booms, masts (2 piece) , sails

A further development of sails was introduced where sail sizes were not limited such as in slalom racing and Formula Windsurfing disciplines. The sail was designed with a loose leech. This allows the upper end of the sail leech to twist away quite significantly. This makes the sail a great deal less powerful than a sail of the same size with a conventional tight leech. The advantage however is that the sail becomes more controllable and comfortable to handle especially in gusty conditions. The loss of power can be compensated by selecting a larger sail size.

Latest Development

The latest and most exciting development for windsurfing boards is the replacement of the fin with a hydrofoil (Fig 14). This enables the hull of the board to be raised clear off the water surface, greatly reducing the drag of the board in the water and thereby increasing the board speed in lighter winds (Fig 14.1). It has the additional advantage of enabling the board to go upwind much better than existing shortboards, even matching the ability of raceboards. This new board has already been approved to replace the RS-X at the Olympics following the Tokyo Games.



Fig 14 – Foil



Fig 14.1 – Wind Foil Racing in Singapore

Authors: Denis Wee & Lemmy Teo
10th November 2020

Note: In writing the above article, we have included pictures from all sources to allow readers to have a better appreciation of what was written. In the event you are the rightful owner of the pictures and agree to displaying your pictures here, we would like to convey our appreciation to you. On the other hand, if you do not agree to have your pictures posted here, do write to us at singaporewindsurfing@yahoo.com and we will remove them. Thank you.