

Topper Production



The early story of the Topper centred around John Dunhill, a member of the legendary Dunhill family. At that time in the early 1970s, John Dunhill was establishing a small boat building business and he spotted a set of moulds for an eleven foot sailboat. These moulds were for what was to become the first Topper. John sought out Ian Proctor the designer and after they reached an agreement the boat was rechristened the Topper and launched as a traditional fibreglass boat.

Sometime later in the 1970s, ICI and one of their moulding companies, Rolinx, were developing ideas on new processes that would enable the production of very large injection mouldings. They wanted to demonstrate to the automotive trade the possibilities of these new processes. The novel method agreed upon to achieve this was to select a boat and then to injection mould it. With this in mind two senior engineers and managers from ICI visited the London Boat Show, and after a brief conversation they decided to each walk in opposite directions around the show and then meet up again at the end of the day to discuss their findings. Remarkably and with a stroke of good fortune they both decided the Topper presented the best opportunity. They approached John Dunhill, there and then, and outlined their ideas of moulding the Topper in polypropylene at the rate of one every seven minutes, in identical weight and shape.

Soon after, the directors of Rolinx, ICI, Ian Proctor and John Dunhill met to devise a strategy to achieve the objective of injection moulding the Topper. At the same time, after purchasing a Topper, one of the senior executives of Guinness had become a devoted Topper addict. This led to the acquisition of John Dunhill's fledgling company by Guinness Leisure, and a whole new world of opportunities opened up for the Topper.

The concept was great and unique and no other boat company had the funds or the vision or the risk mentality of approving such a considerable investment in such a project.

In today's money the main tool would cost a staggering £1,000,000 to replace (that's what our insurance company say) and all the other tooling including the daggerboard, the rudder, the tiller and the mastgate, we know would cost a further £200,000.

The main tool story in itself is interesting and pretty unique. The toolmaker assigned to the project quoted the normal gestation period for such a tool as over 12 months resulting in yet more furrowed brows. Eventually and pioneeringly it was agreed to cast the tool instead of machine it and use an alloy of zinc and magnesium alloy, named kirksite. This necessitated the use of strong steel bolsters to hold and protect the tender tool.

The funding of over £250,000 at that time was provided on a half and half basis by J.V Dunhill Boats Ltd (which later became Topper International Ltd), the new Guinness Leisure owned company and the National Research and Development Corporation. The second half payment from the NRDC was subsequently repaid in full by royalties on sales.

In 1977 the 'new' Topper received the prestigious Design Council Award and was also recognised by the plastics industry and received their coveted Horner Industry Award.



The first injection moulded Toppers were manufactured at Manchester based Rolinx, the aforementioned ICI owned subsidiary. By the early

1980s Guinness Leisure were having a rethink about the whole of their leisure businesses and the decision was made to concentrate on their core business and sell off their varied leisure interests, which also included Sunsail.

In 1983 I had the great pleasure to purchase Topper International Ltd from Guinness Leisure. I remember it well. As with most acquisitions for disposals lawyers always take their time and it proved to be a very long winded process. It was 5.00am when events were concluded. After a sigh of relief I suddenly realised I had a boat company to run which would be opening for business at 9.00am the very next day in Torpoint Cornwall. I was in Clifford Chance offices in Blackfriars. At 9.00am I was in Torpoint, via a taxi to Victoria, a train to Gatwick, a plane to Plymouth, a Taxi to the chain ferry to cross the Tamar, and a leisurely walk to the waterfront offices of Topper International Ltd. Before we brought the business back to Kent I had watched from the office window the warships of our navy limp back from the Falklands including a very black and scarred Hermes.

At that time Rolinx was also under reorganisation by ICI and moulding with that company had ceased. I made the journey to Manchester to see if anything could be done to resurrect the moulding relationship, but the quantities demanded for production runs were unrealistic for Topper.

This was April 1983. After much research and negotiations Topper International Ltd had identified 3 companies in Europe who were capable of moulding the Topper. One declined at the first fence and the other fell by the wayside on timing. Eventually Sulo in West Germany moulded the first of the Toppers, under the new ownership. The first Topper moulded in West Germany by Sulo was Topper 25000.

Seven years later on, following the reunification of Germany in 1990, Sulo decided to concentrate on their core business and once again the search was on for a new moulder. The relationship with Sulo had been very good and we did leave quite a few new Topper sailors amongst their staff.

Once again there was a stroke of good fortune as the second company on our original list, Otto, had decided to open a brand new moulding facility in the UK, at Measham near Derby. It was no accident that the new facility was to be sited at Measham. This was to be close to the motor giants Toyota.

One of the reasons why Topper potential moulders are such a rare breed is that the deck tool and the hull tool are so big. At that time these tools were regularly referred to as the largest injection mouldings in the world.



General factory view showing scale of the machinery required to injection mould the Topper

The all up weight of the two tools for the hull and deck mouldings is 60 tonnes (30 tonnes for each pair) and the overall dimensions are 4 metres x 1.5 metres. To accommodate each tool Topper/Otto use twinned 3,000 tonne Battenfeld injection moulding machines, giving a 6,000 tonne clamp force and 4.2 metre x 3 metre mould size, a facility which is unique to the Topper.



Deck tool in the press

The nucleus of this production unit is formed by two self sufficient injection moulding machines each with a clamping force of 3,000 tonnes and linkable both mechanically and via a common control system. These two machines can of course be used independently of one another for the production of items up to 23 kgs.

For production of larger items such as the Topper, the mould weighing 60 tonnes is clamped into both clamping units; both injection units then inject the melt (molten plastic) via a common hot runner system.

In order to make both separate and combined operation possible it was necessary to design platens of an unusual shape and size, namely 4200 mm high x 2100 mm wide, but it is precisely this shape of platen, which offers significant advantages for both modes of operation.

When used for twin operation the platens are almost square and lateral introduction of the large moulds for large capacity mouldings such as the Topper, is facilitated considerably by the enormous vertical distance between the tic bars of 3000 mm.

Two pairs of short stroke cylinders arranged one above the other, each cylinder having a clamping force of 15000 kn, which ensure a uniform distribution of forces over each of the two rectangular platens. The two machines are each controlled by a separate Unilog 8000 microprocessor open and closed loop control system. For twin operation such as the Topper one of the control systems takes over the master function.



Hull tool showing cooling arrangement and robot arm extracting a moulding

The hydraulic pumps of this twin system together have a drive output of 660 kw. The cylinder heating system has a total capacity of 455 kw. The net weight of the entire production unit is in the region of 700 tonnes.

A factor which decisively influences the flexibility of the production unit is the method used for demoulding. In today's Health and Safety conscious age it would be unthinkable for the moulds to be demoulded by manpower as was the case with Sulo. Here the parts are not removed in the conventional way (vertically), but sideways through the opened safety guard. This demoulding operation is carried out by two robots which operate on both sides of the twin injection moulding machines. Available handling time and buffer capacity are doubled because the robots can demould alternatively when the machines are used for twin operation. In addition to the six necessary degrees of freedom the robot also uses the U demoulding axis.



Deck tool separated after removal of moulding



Robot moving a hull moulding through safety cage. The moulding is held in place by suction cups on a frame

Believe it or not I have edited much of the techno jargon from the moulding and demoulding process, but I have left some, because I believe there is a little bit of nerd in all of us. So make sure you slip one of the important facts about the Topper moulding process into your bar room chat at the local sailing club. It is certainly impressive to see in action. Save it to say when I take a traditional boat builder to the facility they usually threaten immediate suicide, at the perceived death knell of their craft.



Hull tool and robot just picked up moulding to remove



Robot arm removing deck moulding prior to manual trimming



What it means to you as sailors is that you get a hull and deck that is guaranteed to be uniformly strong and have a tolerance of just + or -0.25 kg. The polypropylene also guarantees enormous impact resistance and low maintenance. Perhaps that is why many Toppers sell for more than their original cost and all retain a very high resale value.

Having seen the standards of sailing at recent events and the contribution the Topper, the Class, and its Coaching has made to its sailors, I reckon the Topper is a hard act to follow and certainly a decent investment.

Returning to the moulding of the Topper it would be cosy if the story ended there, but Otto, also reorganised their production empire and the Topper tools enjoyed moves to two other facilities within the Otto group, firstly to Chalon near Lyon in 1992, and then Neurippin near Berlin in 1998. Even last year we all held our breath as Berlin first accepted our May 2008 production slot, and then kept us waiting until Xmas 2008 when a kind gentleman called Ralf gave up his Xmas holiday in order to mould the Topper. I am pleased to advise that we are now on much safer ground because a further machine capable of twinning has been installed in Berlin over the last winter period giving a much increased capacity.

The mouldings are stored on stillages which take 20 mouldings each. They load easily on to Lorries for transport and also serve as storage platforms in our assembly yard. 240 mouldings will fit on one lorry in this way.

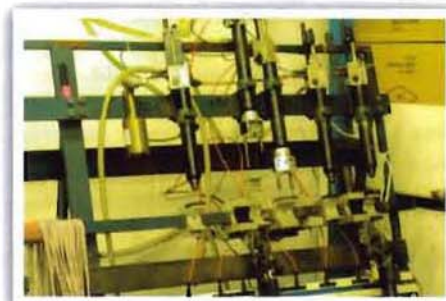


Hull and deck mouldings stored on stillages



Topper International Ltd 40 foot articulated lorry

The hull and decks are then delivered to Ashford, Kent to be assembled with loving care, via a detailed step by step documented process with quality control at each major stage. In January 2009 Topper assembly returned to our home base in Kent after several years at our Brightlingsea facility. We are now able to evaluate the move back to HQ and we are definitely agreed that it was a good decision. We also know that our welcome and regular visitor Dave Cockerill approves of the relocation.



Topper computer controlled spar drilling jig



Topper hull drilling jig



Topper hull drilling jig and Topper hull welding jig

The main part of the assembly process consists of welding the hull and deck together. The welding is carried out in a purpose made horizontal jig. After the buoyancy mouldings have been put in place and the bailer hole routed and the gasket installed, welding braid is inserted along the gunwale of the hull and deck mouldings.



Topper hull assembly showing buoyancy mouldings showing welding braid being fitted. The computer welder is pictured in the background



Topper hull assembly showing welding braid being fitted

Transom inner plates and the mast heel gaskets are also installed. The hull and deck are then clamped together. An even join is further ensured with an air gasket. A computer controlled current cycle is connected to the braid which in effect fuses the hull to the deck.

The rest of the assembly process consists of a further 30 individual steps including fitting out the hull with toestraps, bailer, transom fittings, mastgate, hull plate and daggerboard mouldings. Last of all the coveted ISAF International Class badge is affixed along with the RYA certified CE plate. The hull is then bubble packed and shrink wrapped depending on its destination and another Topper hull is ready for its new owner.

The aluminium of the spars is quality controlled by the mill and comes to us as a special section pre-cut to length.

The individual spars are computer drilled on a drilling jig, and the relevant fittings affixed as laid down in the drawings and assembly manuals. The spars are packed in one box and the rudder assembly, sail and instructions in another.

Assembly process takes approximately 3 hours for each Topper. Each stage of the Topper build is clearly laid down and so if any of you have half a day to spare and would like to build your own Topper we are open to bookings.



Topper boat park. No Toppers! All Sold!!

**By Martin Fry - Managing Director
at Topper International**