

# Olympic class laser sailing dinghy uses world class composite materials

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The International Laser Class sailboat, also referred to as the Laser Standard, but most commonly called a Laser<sup>®</sup>, is a popular one-design fiberglass dinghy that is sailed the world over, with boat sales in excess of 220,000 boats. Over the last 46 years, Laser has grown to become a globally recognized sailing class and brand. It received a massive popularity boost in 1996 when Laser Standard became a new single-handed men's Olympic sailing class, with Robert Scheidt of Brazil (Gold), Ben Ainsle of GB (Silver) and Peer Moberg of Norway (Bronze) winning the first Laser class Olympic games medals in Atlanta, USA. In 2008, the Laser Radial, with a smaller sail, was first sailed as a new women's single-handed Olympic-class boat in Beijing.

As a one-design class of sailboat, all International Lasers are built with the same hull specification of 4.19 m (13 ft 10.5 in) length, with a waterline length of 3.81 m (12.5 ft), and a hull weight of 56.7 kg (130 lb), but there are now three association recognized types of Laser in the international racing class with smaller sail sizes to suit different weights and age of sailor. The Laser Standard sail has a sail area of  $7.06 \text{ m}^2$  ( $76 \text{ ft}^2$ ) and in high winds can reach speeds of 15 knots in the right hands (Fig. 1).

International Lasers are manufactured under licence and supplied by LaserPerformance, a privately owned company, created in 2007 after a merger between the original International Laser boatbuilder Performance Sailcraft Europe and Vanguard Sailboats, located in Rhode Island, USA. There are also two other licensed manufacturers: Performance Sailcraft Australia and Performance Sailcraft Japan. Over the last ten years, Laser-Performance has become the world's largest composites manufacturer of small sailboats. It is no longer regarded simply as a licenced boatbuilder, but is now known as a global lifestyle brand and company that manufactures and distributes a wide range of fun, leisure and racing dinghies and water sports related products. It also provides training and sailing events such as the LaserPerformance Collegiate Cup, an annual international race event for university students. All International Lasers, as well as other different types of FRP composite sailboats and brands manufactured and supplied by LaserPerformance, are produced in the UK, North America, Japan and China using marine approved resins, gelcoats, and structural adhesive materials all developed and regionally supplied from Scott Bader's operations in: Wollaston, England; Drummondville, Canada; and Shanghai, China.



#### FIGURE 1

Deck molds prepared ready for spray application of Crystic<sup>®</sup> LS97PA iso gelcoat as the first production stage of Laser Standard dinghies in the UK. (Image courtesy of LaserPerformance Europe Ltd.).

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#### **ARTICLE IN PRES**

### **Design origins**

**FEATURE** 

The original design and prototype of the Laser dinghy was conceived and developed in 1969 by Canadian boat builder Ian Bruce, designer and vachting magazine editor Bruce Kirby, and sail maker Hans Fogh, all competitive sailing enthusiasts. The idea was initiated, but never taken up, by a North American camping equipment supplier, which commissioned the design of a small, lightweight, affordable sailboat that could be carried on a car roof rack. The all fiberglass 'Weekender' prototype and forerunner to the Laser was first produced in Canada in 1970. It made its first US competitive appearance, with a few sail modifications, in November 1970 at The Playboy Club in Lake Geneva, Wisconsin, where it took 1st place in the "America's Tea Cup Regatta" for its class of new single handed boats costing under US\$1000. This regatta event for new boats had been organized and run by 'One Design and Offshore Yachtsman' magazine, edited at the time by Bruce Kirby. Of note was the fact that in this same race was also the now famous Windsurfer (Fig. 2).

The newly branded 'Laser' sailboat made its debut in February 1971, being officially launched at the New York Boat Show. It was an instant success, selling 400 boats during the show. The new Laser single handed dinghy's popularity at the show was helped by the fact that only three months before the 'Weekender' prototype version had easily won its class in Wisconsin. The appeal of the original International Laser dinghy was a combination of being affordable, fast and exciting to sail with also being very easy to rig and handle. It was light enough for two people to carry and put on a roof rack or boat trailer, and its clever design made a Laser simple and very quick for one person to set up, dismantle, and get in and out of the water on a launching trolley. The rig of a Laser includes a 'push fit' dagger board, a slot on rudder and tiller, and a single 'sloop rigged' mainsail with an integrated sleeve on the longest 'luff' part of the sail which slides over the assembled tubular aluminum cantilevered mast; the 6169 mm mast is made up of two easy to store sections which slot together. Once on the mast, the foot of the mainsail is pulled tight and tied off at the clew end of the one piece aluminum boom. An experienced Laser sailor can rig and be ready to go in under 20 min (Fig. 3).



FIGURE 2

The next stage is to apply Poly-Bond<sup>®</sup> B55R for the mast step, then Core-Bond<sup>®</sup> B72 with the priming resin to bond in the SAN foam core sections into the deck prior to application of the glass fiber layers and Crystic<sup>®</sup> 489PA back up resin. (Image courtesy of LaserPerformance Europe Ltd.).



#### FIGURE 3

Once demolded, the edging of the fiberglass deck is sanded to deburr and ensure good adhesion of the deck to hull joint, bonded together using Poly-Bond<sup>®</sup> B37W. (Image courtesy of LaserPerformance Europe Ltd.).

#### Improving production and quality

LaserPerformance Europe now manufacture all its Laser and FRP boat models in the UK using Scott Bader's Crystic<sup>®</sup> 489PA Lloyd's Register of Shipping approved isophthalic polyester marine hand lay-up resin as part of a matched laminate system with Crystic LS97PA low styrene content (27–29%) isophthalic spray gelcoat, also Lloyd's approved (only white pigmented gelcoat below the waterline); the base resin used for LS97PA is tested in accordance with BS EN ISO 12215-1:2000. Crystic 489PA resin replaced a previous supplier's resin for the FRP hull and deck sections, which was a major step for LaserPerformance to take, but one which was made for both technical and production reasons. Technically, Scott Bader's isophthalic chemistry based 489PA back up resin provided enhanced mechanical properties for molded parts, with a much stiffer laminate which improved the quality and performance of boats produced.

On the shop floor, the processing benefits and cost saving efficiencies were significant. Steve Morris, Pre Delivery Inspector, LaserPerformance Europe commented: "When switching supplier there is always a degree of apprehension. However, it was clear from the outset that moving to Scott Bader was very beneficial and the right decision. The technical advice and support we received was second to none. Switching to using Crystic 489PA as our main laminate resin benefited product quality by improving the overall stiffness of the key deck and hull parts, as well as providing production efficiencies. Scott Bader made switching supplier a seamless process, and we have been extremely impressed with the high quality products supplied and the ongoing technical expertise provided. Our relationship with Scott Bader continues to grow and benefit LaserPerformance." UK Production Manager for LaserPerformance, Gogol Kafi, added: "Scott Bader products are now our first choice for Laser production. The extensive range of laminating and bonding products available cover all our Download English Version:

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