The Next Generation
in
Catamaran Performance

Teknicraft Designs

All American Marine, Inc. has been building Teknicraft catamarans for over five years. The popularity of these vessels reflects major advantages of the Teknicraft design relative to other fast catamarans, including better stability and fuel efficiency. Hydrodynamic lift produced by a hydrofoil that is affixed amid-ship between the two demi-hulls, reduces water being displaced by the hull, which results in a smaller wake wash. The foil also significantly enhances the performance of the vessel. The smaller wake wash is a significant selling point in view of environmental concerns about shoreline damage caused by the large wakes of other more conventional type catamarans.

A key performance goal for the Teknicraft catamarans built by All American Marine is not only high speed, but also the ability to travel fast in rough water while maintaining a smooth ride. The boats feature a wide tunnel with a high ceiling between the semi-planing demi-hulls. This allows free passage of wind waves underneath without slamming against the underside of the deck above. In addition to the foil affixed amid-ship, non-adjustable stern foils are also incorporated on the inside of each hull at the stern, controlling the ride attitude of the boat at lower, semi-planing speeds.

Crew comfort is further enhanced by a series of longitudinal chines or steps on the inside of the tunnel walls and one on the outside of the hulls. These serve two purposes: 1) Adding strength without adding extra material by bending the steps into separate sections of the hull plating; and 2) Creating a cushion for the boat to ride on by forming a high-density air/water medium inside the tunnel between the demi-hulls.

Salient Features

General

The hull form is a semi-planing type catamaran. It employs a combination of symmetrical and asymmetrical sponson shapes, thereby combining the attributes of both shapes in one hull. The symmetrical bow-section ensures directional stability in short swell conditions and following seas, while the asymmetrical midships and aft sections ensure softness of ride and reduced wetted area which enhances comfort and economy.

The catamaran hull has a high tunnel ceiling with a large opening between the sponsons, which allows free movement of wind-waves without slamming on the wet-deck. Horizontal steps on the inside of the tunnel walls act both as chines to deflect green water from the hull surface, and to break up the solid water into spray.

Comfort

The hull is particularly soft riding and is ideal for passenger ferries where comfort is of great essence. This is mainly due to the vertical inside shape of the sponsons, which reduces the planing area, thereby reducing the vertical acceleration forces.

However, a further important feature in enhancing passenger and crew comfort is the action of the longitudinal chines on the inside of the tunnel walls. As solid green water is broken up into spray while being deflected from the hull, it mixes with air streaming down the opening between the sponsons. This mixture of spray and air creates a high-density medium inside the tunnel, which causes a dampening effect each time the hull moves through a trough of a wave.

Since the vertical accelerations caused by wave action on this type of hull is lower than most other types of craft, the vessel can maintain service speeds in relatively rough conditions without compromising the comfort of its passengers.

Performance and speed

The action of the longitudinal chines inside the tunnel, as well as wide chines on the outside, both deflecting water away from the hull, reduces the wetted area and therefore the resistance of the hull. The vertical inside shape of the sponsons minimizes wave interference between the sponsons, which further reduces drag. The combined effect is a hull with low resistance, low vertical accelerations and therefore excellent performance. A further benefit of the vertical inside shapes is that the direction of forces imposed on the hull during turning, causes the vessel to bank inwards on turning, similar to a monohull, thereby increasing high speed turning performance and safety.

In applications where speed is of essence, hydrofoils are fitted to the hull. It consists of a main foil spanning the tunnel forward of the center of gravity position and two cantilever type foils near the stern. The lift produced by the hydrofoil reduces the hull resistance, which increases speed; while at the same time increasing the load-bearing capability. The stern foils create vertical lift at semi-planing speed, which reduces the trim angle while getting onto the plane. This significantly reduces both the power required and the wake wash in the low speed range. The mainfoil action reduces the power needed to maintain service speed, therefore fuel consumption and running costs are reduced. Unlike conventional hydrofoils, which lift the hull completely out of the water, the main foil is designed to only partly reduce the draft, thereby reducing resistance, but still maintaining good sea keeping by having the hull still partly submerged. The hydrofoils further enhance the softness of the ride, especially in choppy seas.

Probably the most outstanding feature of this hull-form is its soft riding characteristic. The ability to maintain high speed in rough water conditions makes the hull particularly suited for para-military and passenger ferry applications, whereby voyages or scheduled crossings need to take place in all weather conditions.

Wake

The height of the wake produced by catamaran type hulls is much reduced as compared to conventional monohulls, due to the reduced wave making resistance of the long, slender sponsons. The action of the hydrofoil support system, which reduces the draught and therefore the amount of water, which needs to be displaced by the underwater part of the hull, largely reduces the wake. The reduced draught also lessens the hull's wake sensitivity to shallow water and sandbanks, which make these vessels ideal for rivers, harbors and other wave sensitive areas.

Independent testing recently done by Fox Associates in Seattle, Washington on the All American built *Condor Express*, launched in February 2002, revealed that it came in 28% under the guidelines set by the Washington State Ferries for operation in Rich Passage, an extremely sensitive wake wash area. Fox Associates also stated that the Condor Express had the lowest wake energy of any vessel that they had ever tested.

Safety

Catamarans are generally the safest type vessels due to the high transverse stability of the hull shape as well as having two separate hulls contributing to positive buoyancy in case of damage.

Watertight bulkheads divide the hull into eight compartments, all capable of supporting a substantial displacement, in case of flooding of other compartments. Design work is done in accordance with rules of various classification societies, with statutory safety requirements adhered to as well. When necessary, designs are officially approved prior to construction of the craft and the construction surveyed to maintain standard of build.

Economy

The lower resistance of the hull necessitates less power and therefore less fuel to attain a given service speed. Ensuring that all systems are simple to run and easy to maintain further reduces running cost.

The hydrofoils, being permanently fixed in one position and constructed of high strength corrosion resistant steel or aluminum alloy, need no maintenance. They are fixed above the keels of the sponsons and are therefore no more vulnerable to damage than the hull itself.

Space

The high beam to length ratio of the catamaran hull provides a large deck area for placing passenger seating, deck cargo, fish storage, industrial equipment or equipment for entertainment. Due to the high stability of the hull, second and third tier decks can be fitted to increase space without compromising on comfort or safety.

All American Marine Company Profile

All American Marine, Inc. (AAM), located in Bellingham, Washington, has been a leading manufacturer of commercial fishing vessels for Alaska's Bristol Bay and Cordova fisheries since 1987. The company's founder Pat Pitsch focused on designing and building highly functional and innovative fishing vessels, which were sold at very competitive prices.

In 1999 under the direction of CEO and co-owner, Matt Mullett, AAM began to diversify into additional product lines by entering the fast catamaran and sports fishing charter vessel markets. AAM developed a working relationship with a progressive naval architecture firm in New Zealand, gaining access to "cutting-edge" catamaran designs on an exclusive North America basis.

AAM has benefited from steady growth in sales in a market that has driven many competitors out of business or into other work. AAM's strategic marketing efforts have allowed the company to capture a steady stream of vessel building projects, including several large catamarans and sports fishing charter vessels. This volume of business has created an opportunity for AAM to strengthen its skilled production staff and management structure. The new markets and strong reputation in the commercial fishing industry are expected to result in sustained growth.

Mission Statement

All American Marine, Inc. is in the business of building high quality aluminum monohull and multi-hull vessels that represent the best value on the market. This is done in a manner that relies on innovation and results in products and services that exceed our customers' expectations.

Business Concept

AAM works very closely with its customers to design vessels that uniquely meet their needs. The company is willing to be innovative, with the result that each vessel is essentially custom built to the owner's specifications and done in a manner that allows reasonable pricing.

Quotes from Customers and Trade Publications

"All American Marine once again has built an outstanding boat in the *Shearwater*! As I've stated before, I have not seen another yard that can equal this work quality, dedication, attention to details and quality management." – *Nic de Waal, Director, Teknicraft Design, LTD*

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Not only did All American Marine deliver “on time and on budget,” pointed out Brodie, “the first day that we put this boat (*Island Adventure)* on line it was the highest grossing day in the company’s history.” *Alex Brodie, President, Superboat, Inc.*

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“Most surprising, this boat is very fuel efficient. At any speed from 18 knots through 34 knots, the boat burns just 2.5 to 3 gallons per mile. There is no fuel penalty for speed! Remarkable! I looked at many catamaran designs before choosing Teknicraft. I am convinced that this is the best design available for speed and comfort in the open ocean.

Condor Express should cut our travel time from three hours to one, and we will be able to make two trips per day, sometimes three.” -- *Fred Benko, President, Condor Cruises*

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“During sea trials, there was little difference in the boat’s fuel consumption between cruising speeds of 20 knots and 30 knots (2.1 gallons per nautical mile and 2.2 gallons per nautical mile). And at just 67% power, *Condor Express* is able to cruise at 28 knots when fully laden, or at 34 knots at 85%.” -- *Fast Ferry International, April 2002*

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“The *Condor Express* has the lowest (wave) wash energy at service speed measured to date by the consultants on any passenger vessel with a capacity of 149 passengers or more.” -- *Ken Fox, President, Fox Associates*

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“In March 2001, All American Marine delivered the 64-foot excursion vessel Islander to our company. It has proven itself as a fast, functional vessel perfectly suited for the choppy waters of the Santa Barbara Channel. The unique hull design allows us to comfortably run at our cruising speed in even marginal weather. We have not had to cancel any of our scheduled trips due to rough sea conditions.

All American delivered as promised. The vessel’s speed and fuel consumption rates are as good as or better than predicted. The quality of the workmanship is exceptional. Our customers often comment on the fine finish work. The welding is excellent, and the attention to detail will reduce our future maintenance costs. We have nothing but praise for the great crew at All American. The designer from Teknicraft was willing and able to find solutions for all of our requirements, the yard manager and project manager were extremely dedicated to producing a quality product on schedule, and everyone was enthusiastic and helpful. In short, it was a pleasure to work with All American Marine.” – *Alex Brodie, President, Superboat, Inc.*

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“Our experience with All American was a positive one from start to finish. The professionalism and workmanship of the All American crew was excellent in all regards.” – *Bill Fletcher, President, Chilkat Cruises & Tours*

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“Many passengers have expressed how pleased they are with this vessel, the speed, comfort and viewing and noise levels. Working with All American Marine, Inc. has been a pleasure. They have excellent craftsmen who pay close attention to details and produce a quality product. Good customer service and fairness contributed to a good working relationship between San Juan Island Shuttle Service and All American Marine, Inc.” – *Mark Goodman, President, San Juan Island Shuttle Express*

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"All of the new All American Marine vessels I have been involved in have met or exceeded the owners' expectations for vessel performance and value. I have not come across an unhappy All American vessel owner." -- *Scott Graf, Marine Manager, Cummins Northwest, Inc. (engine supplier)*

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"I have been working with All American since the 1980's. I've watched the company change from a small, regional builder of fishing boat, to a world class manufacturer of many kinds of vessels. In all those years I always had the feeling that they genuinely cared about the quality and value of the product that they delivered. I can truly say that it's been a pleasure to work with these guys." – *Steve Peake, Hamilton Jet*

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For more information or to get a bid on your upcoming projects, contact

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