

DRETTMANN MOTOR- UND EXPLORERYACHTS – FROM THE IDEA TO THE FINISHED YACHT

Tank tests are indispensable

Every motorboat owner dreams of a yacht that offers the best possible comfort at maximum speeds and with minimum fuel consumption. Achieving the ideal combination all comes down to the hull – reason enough for Drettmann Yachts to pay particularly close attention to this aspect when building the new Drettmann Motor Yachts and Drettmann Explorer Yachts.

The perfect hull is always a compromise – between speed and comfort, between performance and efficiency. Comprehensive tests are therefore vital to find the optimum solution. „Unlike many other yards, we regard tank tests as absolutely essential. A trial-and-error method to find the right balance between design and resistance is not in line with the high quality standards we have defined for each of our new lines. After all, these are crucial requirements for the yacht’s subsequent performance and the comfort on board,“ explains Albert Drettmann.

As we all know, the larger an object immersed in water is, the more water it displaces and the more effort is needed to move it through the water. Hence the ship builder’s obsession to save weight. We also know that certain shapes move through water better than others. A box is less efficient than a teardrop shaped object which allows the liquid’s laminar flow to be gently

“opened” to then quickly close again as the object moves through the water. Another thing all of us have experienced is the fact that water can be quite hard. Hitting the water’s surface with a flat hand creates a much harder impact than hitting it with a fist. Instead of moving through the water the planning hull rises above it and glides across the surface. This works very well but poses a set of problems. Massive amounts of engine power are needed to transit from displacing water to skimming above it. Once on a plane, the sea surface is not always flat, launching the yacht from one wave to the next. This is where the golden compromise lies for a planning boat. The hull needs to have enough volume and horizontal surface to lift itself out of the water at a certain speed, but at the same time possess enough “V” to divide the water’s surface on impact. A nearly flat surface would be the ideal shape to glide across the water, yet a very deep “V” would best for softening the “slamming”.

“Tank testing“ is still the best way to achieve a functional hull shape even though today’s computing power enabled great advances in hull design. However, even to this day the old practice of tank testing is still the preferred method of verifying a hull’s attributes. A precise scale model of the hull is created with the same relative weight and displacement charac-

teristics of the yacht to be built. The model is attached to a mobile towing trolley, leaving freedom of movement for the model in all directions as it is towed across a long pool of water at varying speeds. The trolley moves on rails above the pool. The whole movement is documented by still and video cameras mounted all around and even below the model under the water’s surface, thereby offering a clear view of the hull’s behavior as it moves through or across the water.

The Drettmann motor yacht’s models are tested at a military facility in southern England, in a pool measuring 256 by 12 meters. Different scenarios can be tested in this pool by introducing waves from a number of directions. These waves as well as wind are generated by special machines and allow lifelike simulations which take hydrodynamic as well as aerodynamic deviations into account. A series of sensors on the model hull measure drag, hull pressure, vertical and horizontal accelerations, and efficiency. All the data is later displayed graphically to allow the naval architect to finetune his hull and enable the boat building project to move forward with confidence. If tank test results show some deficiencies in the hull design adjustable elements on the model can be modified and finetuned until the desired results are achieved. If the trim of the model is too far forward or too far aft, the weight simulations can be changed, to determine the exact longitudinal center of gravity of the yacht. The data collected can later be modified in the construction drawings by shifting heavy components such as the engines forward or aft. Water, especially if it is moved by factors such as wind, waves and currents is an incredibly complex element and the exact study thereof exceeds even the most advanced computer’s powers. It is therefore not wise practice to eliminate tank testing from a hull’s development process. Especially for a yacht in serial production, involving expensive tooling, the costly practice of tank testing should be considered a must. Tank testing for the new Drettmann 32 meter Motor Yacht has recently been completed successfully. The project is now entering the structural design phase and the new Drettmann Motor Yacht is expected to be launched in September/October 2012.

