



## THE TYPHOON'S HULL DESIGN

### INTRODUCTION

Thanks to the exceptional hull design, the yachts in the Typhoon range have a unique ride. To achieve this, our partner Sea Level Yacht Design & Engineering carefully met the specific needs of Ceelen & Bekker Yachts.

### THE TYPHOON

The expertise of Ceelen & Bekker Yachts derives from many years of experience building exclusive aluminium superyachts. We realised that this sector had neglected the construction of yachts measuring 30 to 50 feet. This inspired us to build a range of yachts with the name Typhoon.

Our starting point is the construction of superyachts and the materials and construction techniques used in that sector. The initial design for the Typhoon was made in close collaboration with our partner Sea Level Yacht Design & Engineering.

### THE ASSIGNMENT

This was our assignment to Sea Level Yacht Design & Engineering:

*“Design an aluminium ship with a ride suitable for Dutch waterways (coastal areas, big rivers and small inland waterways). The yacht should be able to quickly cover large distances on big rivers, open water and coastal areas comfortably and efficiently, while on small inland waterways it should also be able to sail comfortably and without too much send at lower speeds”.*

The Typhoon has since satisfied all of these criteria.

### THE RESULT

#### *The ride*

Several studies have shown that the ratio between the length of the water line and the hull volume is a good indicator of the ride in waves. A higher ratio means a narrower boat and a better performance in waves. Calm water requires a ratio between 4 and 5, while 6 and up is recommended for sea sailing.

The Typhoon's ratio between the length of the water line and the hull volume is 4.81. We opted for this percentage so the hull is at its best in calm water, but can also handle big waves.

#### *Planing*

The hull of a planing ship tapers into a V-shape. The “angle” of this V-shape is called the “deadrise”. It is specified in the number of degrees with the water line and is variable. A higher deadrise means less hull lift, but a better slice through the waves. However, more resistance means more power is needed to reach the same speed.

Most yachts of this size and range have a deadrise of 16° to 18°. This means less power is needed to reach a certain speed than a higher deadrise would require. However, the big spray rail near the mirror is lower in the water (with the same draft) and therefore creates more waves at lower speeds.

For the hull of the Typhoon 32, Ceelen & Bekker Yachts opted for a V-shape with a considerable deadrise and somewhat rounded beams in the foreship. Midship to foreship, the beams are slightly rounded. Midship to the aft, the beams are straight and the hull's angle to the water level is 20°. This creates an excellent ride in waves and little chop at lower speeds.

# Infosheet no. 2



## *Stability*

The combination with the Volvo Duo-prop stern drive provides good stability for slow sailing. The V-shape across the entire water line acts like a skeg, which is used for this purpose in yachts with a fixed propeller. The Volvo Duo-prop stern drive and the starboard propeller guarantee excellent manoeuvrability.

The Typhoon is heavier than plastic rivals of similar length. This means increased comfort onboard during high-speed sailing, as the boat is less jumpy. The shape of the hull has been optimised using resistance calculations based on studies by Daniël Savitsky, an authority in the field of the hydrodynamics of planing hulls.

The sought-after combination of high speed and a good ride was calculated, but what played the biggest role in creating the end product is the experience of Sea Level Yacht Design & Engineering.

The underwater hull distinguishes itself through the presence of two large and four small spray rails. The two big spray rails increase the level of comfort by preventing water spraying on deck while sailing. They also minimise so-called “rolling”. The four small spray rails on the hull reduce wet surfaces at higher speeds. They reduce resistance and increase “lift”, helping the Typhoon plane more quickly.

## THE CONSTRUCTION

The Typhoon 32 is completely made of AL-5083-H312 Marine Grade aluminium in accordance with American Bureau of Shipping (ABS) standards.

The hull's sheeting material is 5 millimetres thick. For the deck and the superstructure we use aluminium of 4 millimetres. Across the entire hull, the distance between the beams is 50 centimetres.

The ship has been certified for RNY Category C (average waves of 2 metres, maximum wind force 6 on the Beaufort scale). Technically, the hull has been built to comply to RNY Category B standards (average waves of maximum 4 metres, maximum wind force 8 on the Beaufort scale).

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