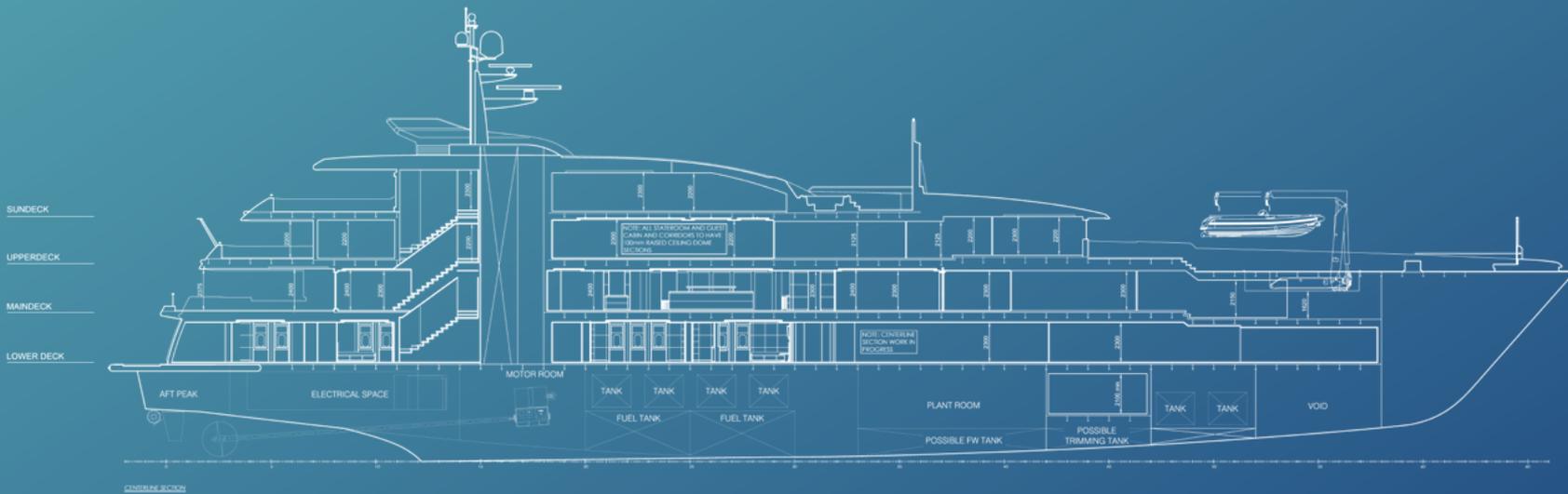


The

SUPERYACHT

INDUSTRY

The state of the art yachting reference



Yacht Basics



ONBOARD

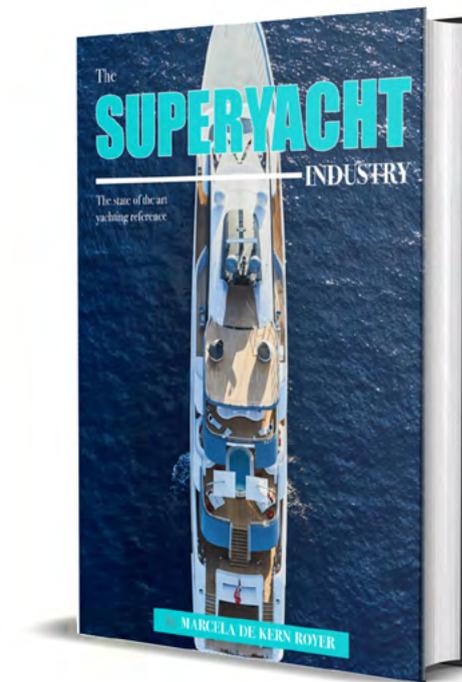
MARCELA DE KERN ROYER

The **Superyacht** industry

- English edition -

The
SUPERYACHT
INDUSTRY

The state of the art yachting reference



This e-book features the Yacht Basics chapter as a preview of [The Superyacht Industry book](#).

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ONBOARD

MARCELA DE KERN ROYER



HSH Prince Albert II of Monaco
Courtesy of Yacht Club de Monaco / Photo: Guillaume Plisson

“The future of yachting begins today and belongs to those of the future. We owe it to the next generation to leave a lasting legacy in which they can grow and learn, not only from our triumphs but our mistakes too. Creating a sustainable future starts with education.

The role of education in the yachting industry promotes development of knowledge, skills, ideas and values required to build on what has already been achieved. The Yacht Club de Monaco firmly believes that only by working together as an industry will we achieve our greatest highs and truly make an impact. Through inspiring the yacht builders of tomorrow we will see a more sustainable future, through educating our industry will we see the importance of conservation filter through to the clients, this book combines the talents of the world's leading experts in the sector and this why I am thrilled to be a part of this project.

Monaco has long been the home of navigators, and we feel it is our duty to support innovation to ensure the longevity of this great industry, while protecting our oceans.

- H.E. Mr Pierre Dartout
Minister of State



“ In accordance with its missions, the Yacht Club de Monaco, presided by HSH Prince Albert II since 1984, strives to encourage Yachting and the practice of it in all its forms.

I would therefore like to congratulate Marcela for this initiative and the hard work and research she has put into this book, which helps better understand the richness and diversity of Yachting professions.

Beyond a shared passion for the sea which unites us all, the sector has established itself as an industry in its own right but remains relatively unknown — although it continues to develop and generate revenue and jobs.

It was with this in mind that the Yacht Club de Monaco launched its ‘Monaco Capital of Yachting’ project, the ambition being to encourage any initiative that promotes the growth of this industry. This includes education through our La Belle Classe Academy training centre and as the home of the Cluster ‘Yachting Monaco’ to federate the sector.

The Yacht Club de Monaco believes it is only by working together as an industry that we will achieve our greatest objectives and truly make a positive impact. It is by inspiring the yacht builders of tomorrow that we will see a more sustainable future, and by educating that we will see the importance of conservation filter through to clients.

We embrace and actively promote innovation in the quest for state-of-the-art technology that will ultimately make yachting more sustainable. In this we are supported by our members, many of whom are superyacht owners and are leading the way.

Our wish is to appeal more and more to the new generation of talented young people who will relish addressing the sustainability challenges we share with other sectors and also recognize their potential to contribute to marine conservation as today’s explorer yachts are already doing.

This book goes a long way towards achieving these goals.

- Bernard d’Alessandri
General Secretary
Yacht Club de Monaco



Foreword

“The world of the superyacht is often misunderstood. Whilst the most visible element of yachting is the end result; a beautifully designed piece of complex engineering cruising in clear blue waters. The reality is that the journey to that point is long and complex – involving thousands of different skillsets and areas of expertise.

In this book Marcela has been able to bring together the knowledge and expertise of some of the leading names in the yacht business, and the outcome is a deeper insight into what I call “the business of yachting”. From the earliest elements of design and engineering through to new construction, sales and charter, yacht management and the legal elements of yachting. In this book, you will have an opportunity to learn about the superyacht industry, from the people who make the superyacht industry. The designers, builders, brokers and lawyers. Informative and insightful information that will be helpful to everyone from an aspiring yacht captain and manage through to an owner and prospective owner.

The world of yachting has changed a lot in the last twenty years. In 2000 the number of yachts over 80 metres could be counted on one hand; today there are 127 yachts of over 80 metres, of which 47 of those are over 100 metres. During that 20 year period the industry has changed a lot also, becoming more professional, organised and sophisticated. Where once yachting was more of a hobby, today it is very much a serious business employing hundreds of thousands of people.

In the next 20 years we will likely see further change and innovations; one area I am particularly excited about is the focus on environment and sustainability; we are fortunate that many yacht owners are prepared to make the big investments needed to innovate and progress the environmental initiative.

I hope you enjoy Marcela’s book and find it both useful and inspiring.

- Jamie Edmiston
Chief Executive, Edmiston



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Photo Credits: Blueid Prod

About the Author

Monaco-resident Marcela de Kern Royer combines a passion for yachting with a strong international academic background.

She is the founder and owner of Onboard, a consulting firm based in Monaco specialised in the sales to HNWI and luxury marketing in the yachting industry. Currently developing Genoa Superyacht hub, previously she has been the Business Development Director for ICON Yachts shipyard in The Netherlands, with past experience in asset management including superyachts, she has gained excellent exposure to all facets of the industry, starting as a supplier and having experience in new build, refit, brokerage, and yacht management.

She obtained an MBA from Hult Business School in Boston, USA and a BSBA degree from the International University of Monaco.

Marcela is an active member of the yachting community the Founder and first president of YPY (Young Professionals in Yachting) Monaco chapter; moreover, she is also the founder of charity Association AMLA (Association Monegasque pour l'Amérique Latine) and a member of the Yacht Club de Monaco.

Marcela has lived, studied and work around the world including Monaco, Boston, Miami, London, Dubai, Guatemala and France. Being a true citizen of the world, she speaks fluently six languages with Spanish as her mother tongue; English, Italian, French, German and Portuguese also.

Growing up in Guatemala she was out every weekend on boats as her dad is a true boat aficionado and sport fisherman having built his own wooden boat himself.

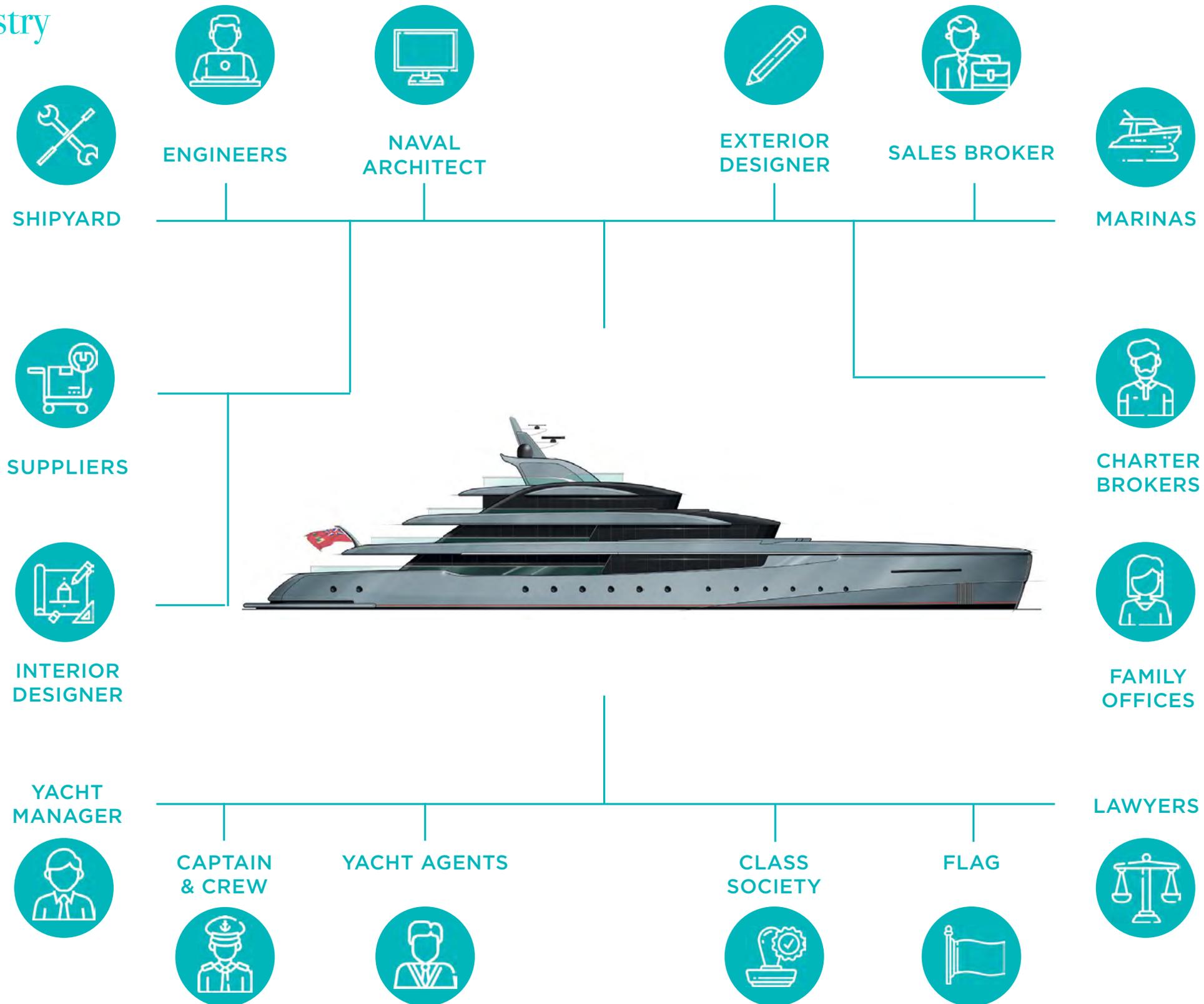
She is married to a German investment fund manager, and a proud mother of her daughter Gracia Sophia born in January 2019. Together with her husband they own a sailboat in Monaco, and are true lovers of the sea, if you are looking for her you would probably find her in the water!

Corporate website: www.Onboard.mc
Yachting Blog: www.onboardwithMarcela.com

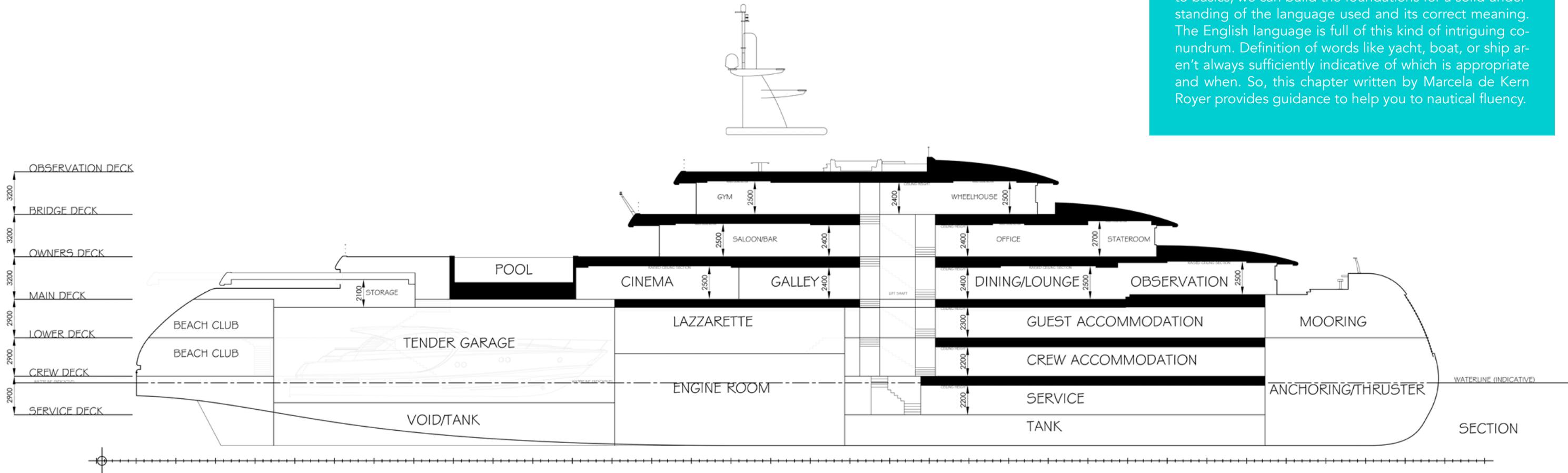


@onboardwithmarcela

The yachting industry



In this chapter we explore the sometimes complex terminology used in the superyacht industry. By going back to basics, we can build the foundations for a solid understanding of the language used and its correct meaning. The English language is full of this kind of intriguing conundrum. Definition of words like yacht, boat, or ship aren't always sufficiently indicative of which is appropriate and when. So, this chapter written by Marcela de Kern Royer provides guidance to help you to nautical fluency.



Chapter 01

Yacht Basics

MY Alfa Nero

Length overall 82,00 metres
 Maximum beam 14,20 metres
 Maximum speed approximately 20 knots
 Accomodation 1 master suite, 2 VIP and 3 twin guest cabins
 Material hull - steel, superstructure - aluminium
 Engines propulsion MTU diesels, 2 x 4680 Hp
 Fuel capacity 294 m³
 Naval architects Oceanco
 Exterior design Nuvolari & Lenard
 Interior design Nuvolari & Lenard, Alberto Pinto

- | | |
|---|-------------------------|
| 1. Passerelle | 16. Life rafts |
| 2. Rudder | 17. The bridge |
| 3. Propeller | 18. Dinning room |
| 4. Tender and toy Garage | 19. VIP cabin |
| 5. Swimming pool (with adjustable floor in top usable as helipad or dancefloor) | 20. Guest cabin |
| 6. Crane | 21. Crew Cabins |
| 7. Reversing gear box | 22. Bulwarks |
| 8. Propulsion engine | 23. Bulbous bow |
| 9. The upper deck | 24. Anchor pockets |
| 10. The sun deck | 25. Bow thruster |
| 11. The main deck | 26. Fore Mast |
| 12. The lower deck | 27. Radar aerials |
| 13. The crew lounge | 28. Satellite dome |
| 14. Crew mess | 29. Captains cabin |
| 15. Elevator | 30. Embarkation station |

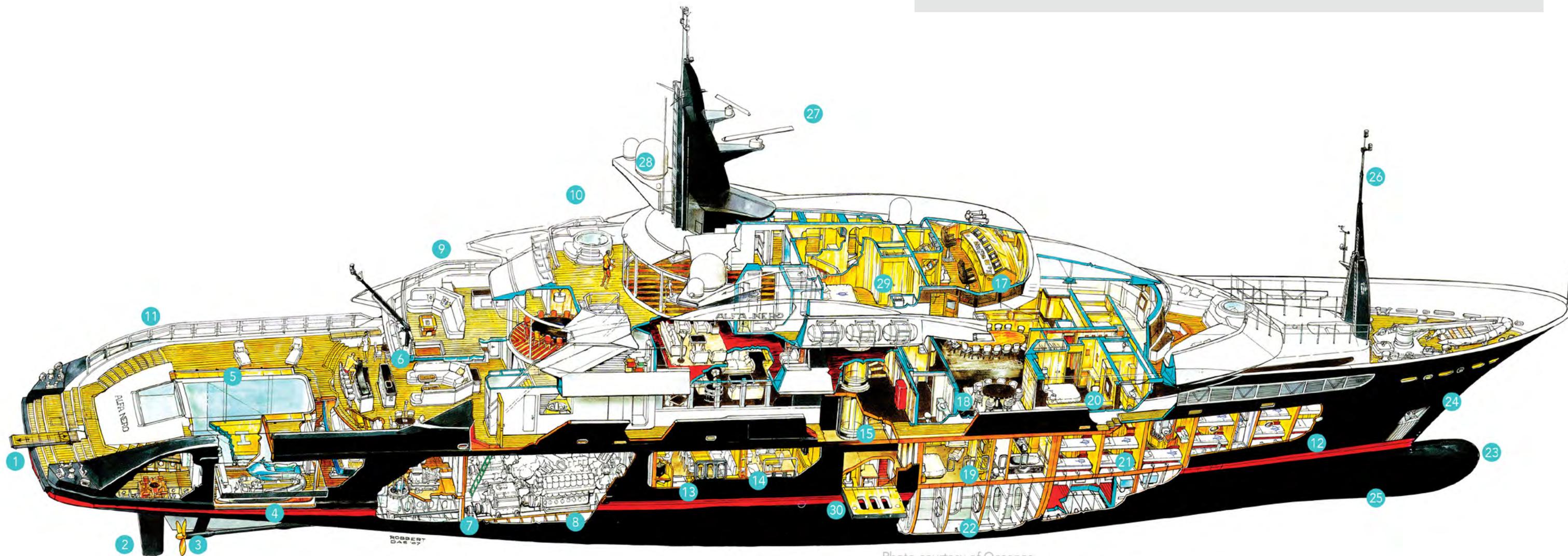
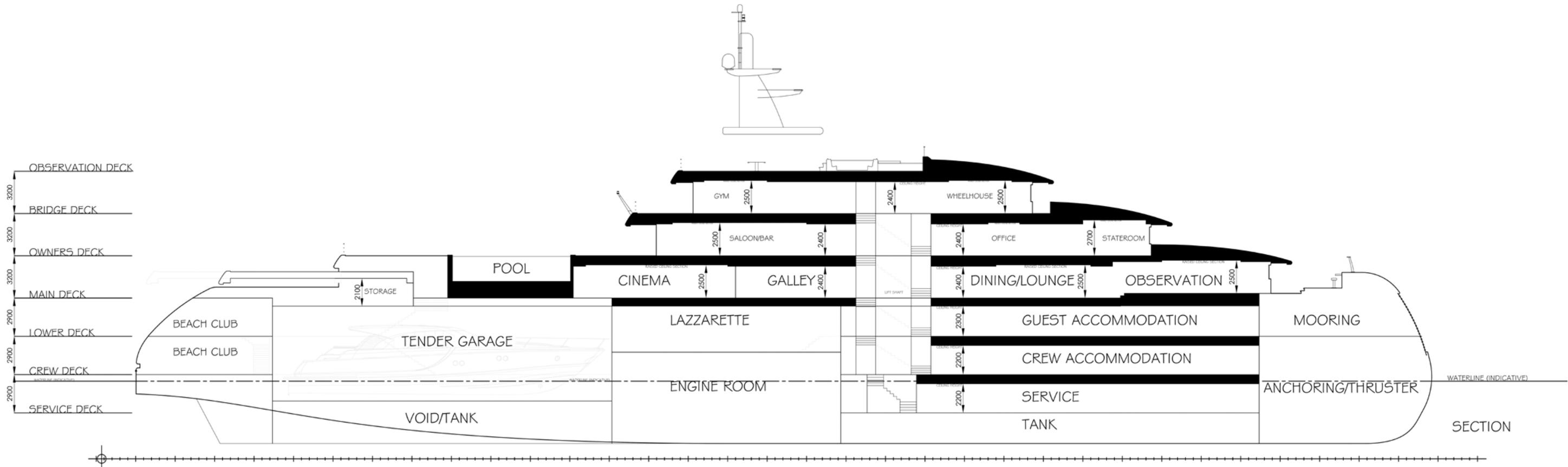
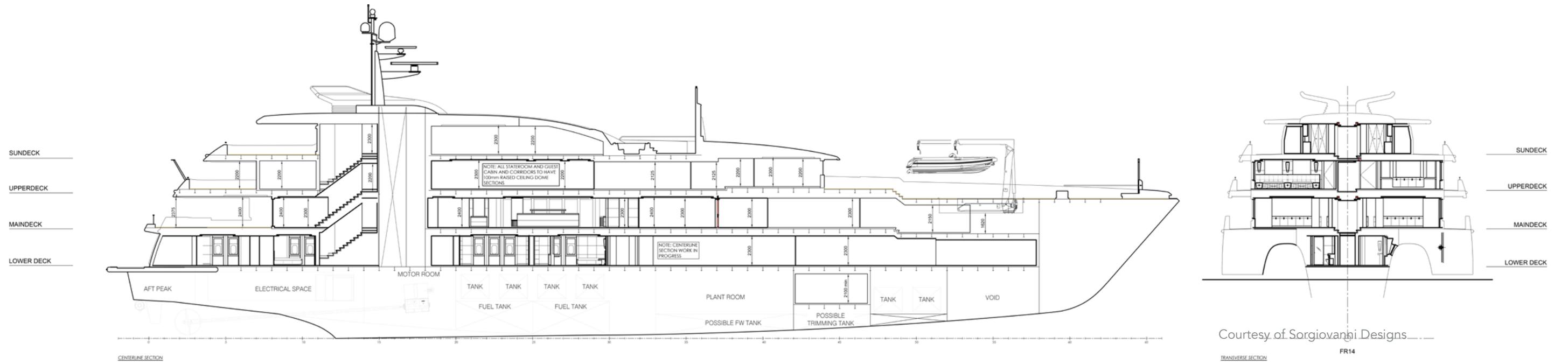


Photo courtesy of Oceanco
 © The Superyacht Industry Book, Marcela de Kern Royer



Courtesy of Sorgiovanni



Courtesy of Sorgiovanni Designs

TRANSVERSE SECTION FR14



WHAT IS A YACHT?

The word “yacht” originates from the Dutch who invented the concept of yachting. It is a derivative from the Dutch word “jacht” meaning “to hunt”. History tells us that a yacht was originally defined as a light and fast sailing vessel used to chase pi-

rates. Over time, wealthy Dutch merchants started using boats for pleasure as opposed to a means of transportation. The word yacht had the connotation of a boat used purely for fun, and this is the best definition of yachting even today!

Yacht vs Boat

“**The difference between a boat and a yacht is that a yacht has a crew; whereas a boat doesn’t.**

- Antoine X. Larricq, yacht broker, Fraser Yachts

YACHTING TERMINOLOGY

Do you speak yachtie?

In this chapter we explore the sometimes complex terminology used in the superyacht industry. By going back to basics, we can build the foundations for a solid understanding of the language used and its correct meaning.

The English language is full of this kind of intriguing conundrum. Definitions of words like yacht, boat, or ship aren’t always sufficiently indicative of which is appropriate and when. So, this chapter provides some guidance to help you along the way to nautical fluency.

Many boating enthusiasts use the words ‘boat’ and ‘yacht’ interchangeably when, in reality, they have very different meanings. A yacht is generally a larger, recreational vessel whereas a boat tends to be smaller in size. A ship on the other hand tends to be the largest out of the three and generally a working vessel.

Interestingly though on Google, the word “boat” is searched for ten times more often than “yacht”. Even superyacht owners refer to their yacht as “my boat”. In fact, most people distinguish anything over a simple floating raft as a boat. It is the affectionate, often nostalgic term most captains use for their yacht.

When determining the difference between a yacht and a boat, there are a few main deciding factors including: size, gross tonnage, cruising area, crew and propulsion.

Size

As previously mentioned, size matters when it comes to differentiating between a boat and a yacht. Anything over 30metres (98feet) would be considered a “superyacht”. It used to be 25 meters (82feet) but as the yachts got bigger so did the definitions. This book focuses on motor superyachts.

When comparing yachts, length is not the only factor; gross tonnage, which is the volume onboard, also makes a big difference. Two yachts can have the same length, but different volumes and they often feel like two completely different yachts.

Gross Tonnage

Usually, a superyacht is over 200 gross tons and when registered as a commercial yacht it has to conform to several international conventions, namely the ISM (International Safety Management

code) and ISPS (International Ship and Port facility code). These both require a shore-based infrastructure to monitor and support the yacht.

Where they can operate

Smaller boats are usually capable of operating in calm waters like lakes, rivers, and shallow harbours. Some larger boats can also navigate rough ocean waters. A yacht, on the other hand, can sail in deeper, ocean waters and withstand more turbulent seas. Due to a larger size, high tech yacht electronics and guidance instruments, protection from the elements, and several other features, yachts are far more suitable for long ocean trips.

Crew

While a boat can be operated by just one captain, a yacht typically requires a full crew to help with navigation, maintenance, electronics and engineering, repairs and stewards to cater to passengers. In reality, it's a more like a small, private cruise service than an afternoon on a boat with friends.

Propulsion

Depending on the boat, it may operate solely using a sail and the wind, or one or more inboard or outboard motors. While some larger boats can mount very large engines to create some real speed on the water, these engines do not match the power of most yacht engines. Yacht engines are much larger in size, can produce considerably more power, and are often capable of running much longer distances.



Courtesy of Bruno Buisson

BASIC SAILING TERMS

Let's begin by learning the definitions of some important terminologies, which are essential nautical terms.

Orientation

Knowing the terminology port side or starboard is like knowing the difference between left and right. Since port and starboard never change, they are unambiguous references independent of a mariner's orientation. Thus, mariners use these nautical terms instead of left and right to avoid confusion.

Starboard

When you are standing or sitting on a yacht looking towards the vessel's front, the right side is the starboard side. The starboard side runs from the front of the vessel to the back. Starboard means 'the side on which a vessel is steered'.

Origin

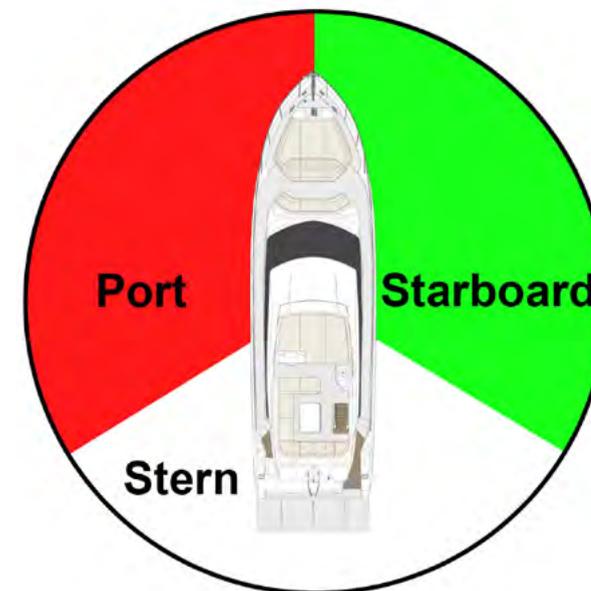
In the early days of boating, before yachts had rudders on their centrelines, boats were controlled using a steering oar. Most sailors were right-handed, so the steering oar was placed over or through the stern's right side. Sailors began calling the right side the steering side, which soon became 'starboard' by combining two old English words, *stéor* (meaning "steer") and *bord* (meaning "the side of a boat"). Facing forward, this is anything to the right of the boat. Same deal as "port"—only the opposite.

Port

Facing forward, this is anything to the left of the boat. When you're onboard, you can use this term pretty much anytime you would typically say 'left.'

Origin

As the boats' size grew, so did the steering oar, making it much easier to tie a boat up to a dock on the side opposite the oar. This side became known as *larboard*, or "the loading side." Over time, *larboard*—too easily confused with *starboard*—was



replaced with port. After all, this was the side that faced the port, allowing supplies to be ported aboard by porters.

A mnemonic used in the Navy for remembering which side is red (and therefore which side is green) is 'Port wine is red, as red wine is.'

Stern / Aft

Referred to as the back of a yacht. If something is located aft, it is at the back of the boat. The aft is also known as the stern.

Astern

The direction toward or beyond the back of the boat (stern).

Bow

The front of the yacht's hull is called the bow.

Stem

Is the most forward part of a boat or ship and is the keel's continuation from below the water to the top of the forward bulwarks where Port and Starboard meet.

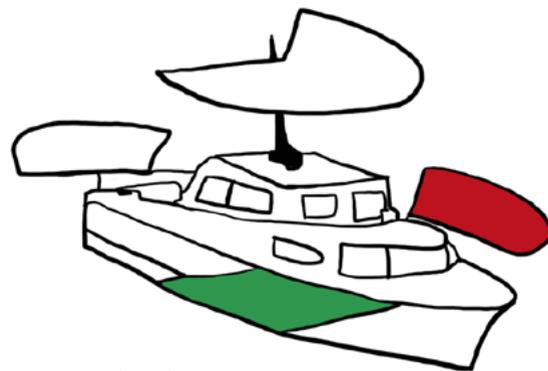
Midships

The location near the centre of a boat.

Lights

Lights

Every vessel has at least two navigation lights; they are designed to be visible to anyone approaching the yacht from any direction. Every power-driven vessel over seven knots of any size and every power-driven vessel over 7m (22.97ft) of any speed has at least three. Then over 12m (39.37ft), its four lights and over 50m (164ft) its five lights. Every sailing vessel has at least three lights.



Masterhead
Port
Starboard
Stern

One of those lights is red, and the other is green. The red light is on the left, or port side of the boat, and covers an arc of 112.5 degrees. The other one is green and is on the starboard, or right side.

The green and red are positioned as so due to the right of way (as with cars) belonging to the yacht coming from the right. So, a yacht coming from the right will see a green light, meaning 'go'. The yacht on the left will see a red light, indicating 'stop' (again, the same as with cars).

Because 'right' and 'left' can become confusing sailing terms when used out in the open waters, port is used to define the boats' left-hand side as it relates to the bow or front.

Wind directions

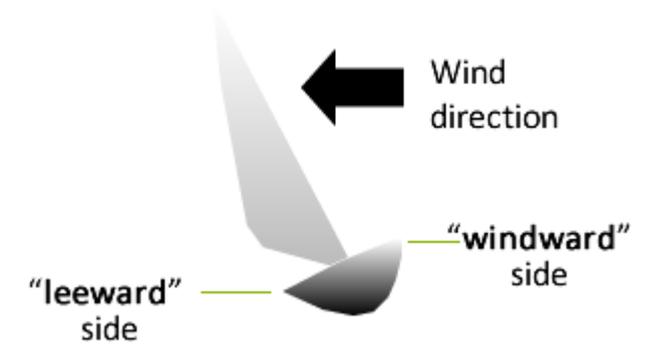
Knowing the wind direction is really important, especially when choosing a safe anchorage; for example, a Lee shore is very dangerous to anchor on.

Leeward

Also known as lee or leeward, is the direction opposite to the way the wind is currently blowing (windward). Meaning the wind is blowing towards it.

Windward

The direction in which the wind is currently blowing. Windward is the opposite of leeward (the opposite direction of the wind). Boats tend to move with the wind, making the windward direction an important sailing term to know.



PRINCIPAL DIMENSIONS

There are many standard measures of a yacht; hereby, are described only the most common ones used.

Overall, Extreme - The dimension of the outside of the yacht's plating or to the yacht's extreme ends.

Length over all (LOA) - The overall hull length (excluding appendages) is the horizontal distance over the extremities from stem to stern. The extreme point forward can be taken on the bulbous bow.

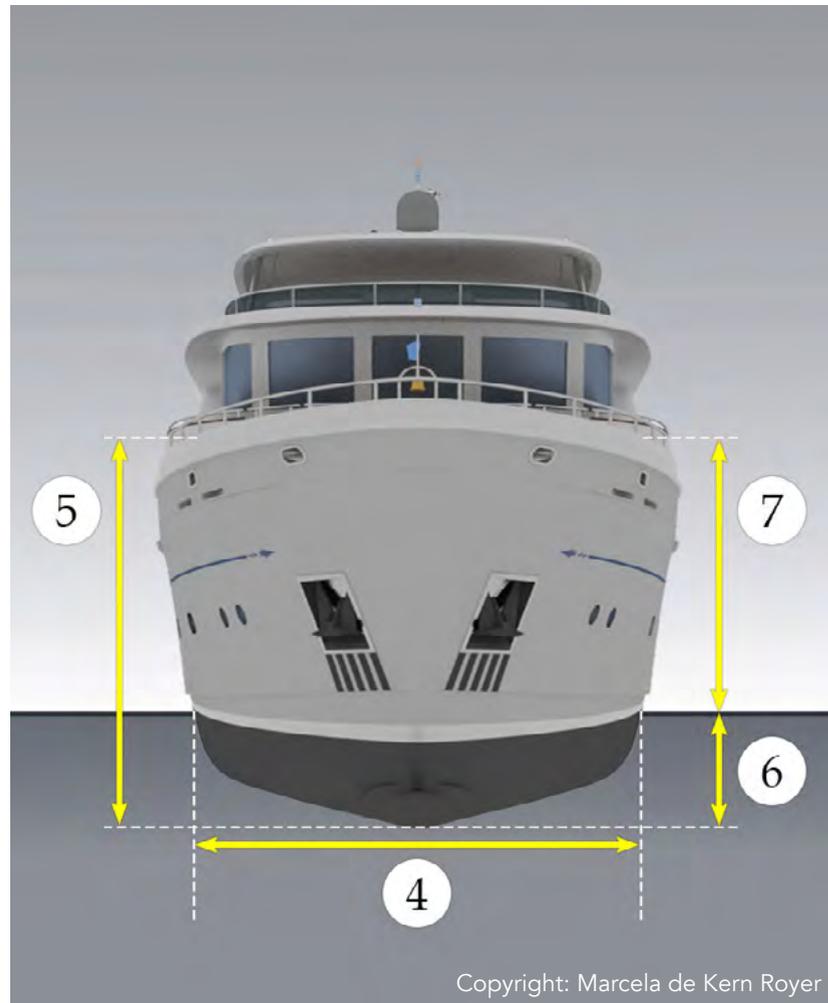
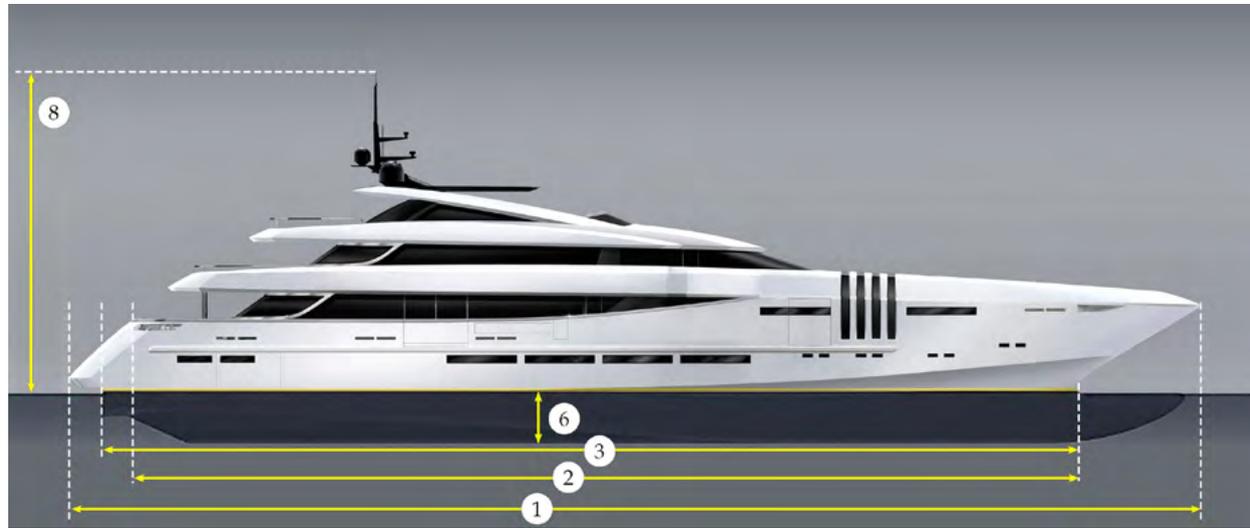
Length between perpendiculars (LBP) - A common measure of the yacht's length.

Waterline length (LWL) - The horizontal distance between where the stern and bow intersect the water. Length measured along the waterline when full-

ly loaded. In case it is not mentioned, the length of the summer load waterline is considered the length of the waterline.

Beam / Breadth - The beam is the widest point of a boat or yacht. The beam measured on deck is the Moulded Beam (BM) the beam including rubrails and other protrusions is the maximum beam (BMAX).

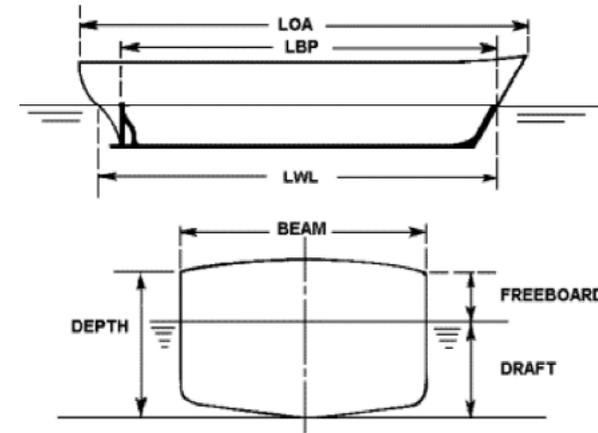
Note that draft and draught is the same thing (American vs British English).



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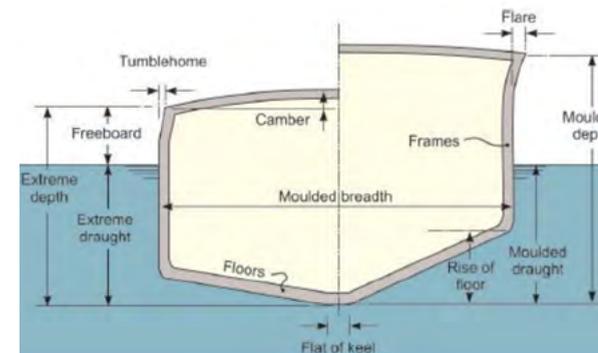
1. Length over all (LOA)
2. Length between the fore and aft perpendiculars (LBP)
3. Waterline length (LWL)
4. Breadth / Beam on the Waterline (BWL)
5. Depth
6. Draft
7. Freeboard
8. Air draft

Draft - The vertical distance between the keel and the waterline. The maximum depth underwater, including the shell plating.



Depth - The height from the baseline to the uppermost continuous deck inside plating, the yacht's depth varies along the length. The yacht's depth is taken as the distance between the undersides of the deck amidships to the bottom of the keel. Moulded draught is measured from the inside of the keel plating.

Draught - The distance between the keel and the waterline at any point along the length of the yacht. Moulded draught is measured from the inside of the keel plating.



Copyright: Marcela de Kern Royer

Freeboard - The distance between the water line and the top of the deck.

Air draft - The vertical distance between the waterline and the highest point of the yacht. On sailing boats that have a tall mast, you see very high air draft that can affect where they can go, some shipyards won't have enough air draft clearance and need to remove the mast.

Forward perpendicular - The vertical line where the bow intersects the waterline.

Aft perpendicular - The virtual vertical line through the centerline of the rudder stocks. The aft perpendicular is the aft reference line for all hydrostatic calculations.

Amidships - Midway between perpendiculars.

Midship section - Transverse section of the yacht's amidships.

Moulded - The term that refers to the internal measurements taken inside the shell plating or outside of the framing.

Moulded baseline - The horizontal line between the top of the keel at the amidships.

Moulded breadth - The maximum breadth at the midship section to the outside of the frames.

Moulded draught - The vertical distance of the top of the keel to the summer load line, usually measured in the amidships plane.

Moulded depth - The vertical distance from top of the keel to underside of the deck plating at the yacht's side.

Extreme depth - The vertical distance from the underside of the keel to the deck surface at side.

Trim - The difference between the draft at the stem and the draft at the stern. The trim is the difference between the forward and aft draft marks. When the aft draft is greater, the vessel is deemed to have a positive trim, and a negative trim when the forward draft is the greater. In such a case, it is often referred to as being down-by-the-head.

MAIN PARTS OF A YACHT

The yacht's dimensions, form and mass are determined by the standard measures and terms. Some of them (not all of them) will be illustrated herein.

Hull

The actual body or shell of a boat is called the hull. It is the part that floats in the water. This includes several different parts of the structure, the interior framework, the exterior including the deck, the bottom, and the sides. It is important to note that it does not include things like the rigging or the mast.

The vessels' hull form determines almost all of its main attributes. Its water displacement capacity, its load-carrying capacity, its resistance in water, the power needed to propel the yacht, its ability to maneuver smoothly, and also its seaworthiness. Thus, it is of utmost importance that the hull shape is defined with extreme precision and without any ambiguity.

The lines plan - Shows the shape of the yacht. The outside of the frames and other internals. The shell plating is fitted around the internals. The thickness of the shell plating is not taken into consideration for certain measurements; those measurements are called moulded.

Displacement

The force of displacement refers to the weight of the water displaced by a floating object, which is equal to the object's weight. Although displacement is expressed in tonnes (units of mass), most people think of it as weight. All the displacements defined below are actually masses because of the units used, regardless of how they are called.

The displacement Δ is the weight of the volume

of water displaced by the yacht. One could also say: the displacement equals the total mass of the yacht.

A displacement yacht is a type of hull that smoothly displaces (pushes aside) water as opposed to tipping up and riding on top of it.

Some common hull terminology includes:

Light weight / Light Ship – The displacement without the crew, passengers, stores, fuel, or any cargo onboard.

Load displacement - The displacement of a yacht at maximum permissible draught.

Deadweight or dead load - The displacement of fuel, water, cargo.

Full Displacement = Light + deadweight.

Ballast - The weight, liquid or solid, added to a yacht to ensure its stability.

Bilge - The lowest inner part of the hull.

Bulkhead - The vertical dividing partitions inside the yacht. Inner walls used for space division, structure, fire retardants and water containment.

Bunker - The fuel tank. Sometimes an expression 'to bunker' meaning to take on fuel.

Keel - The keel is a long, heavy fin on the bottom of the boat that sticks down into the water. It's in the middle between the bow and the stern. The keel is considered the foundation or backbone of a boat. It provides stability and is the reason why

most modern boats are nearly impossible to capsize.

Waterline - The waterline of a yacht when lying in water.

Light waterline - The line of the yacht when it's carrying only regular inventory. This applies only to yachts registered as commercial vessels.

Deep waterline - The line of maximum load draft; when it has a full fuel tank and/or fully loaded, making the weight heavier than the waterline is deeper.

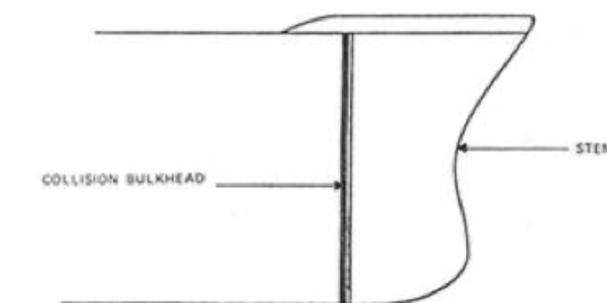
Load line - The mark on the side of the yacht, deemed to be the maximum safe immersion limit for the yacht. It is specified on the load line certificate after the survey.

Summer load waterline or design waterline - The line that runs along the waterplanes, from aft to the fore of the yacht, is known as summer load waterline. It is the line at which the yacht is generally floating with its load.

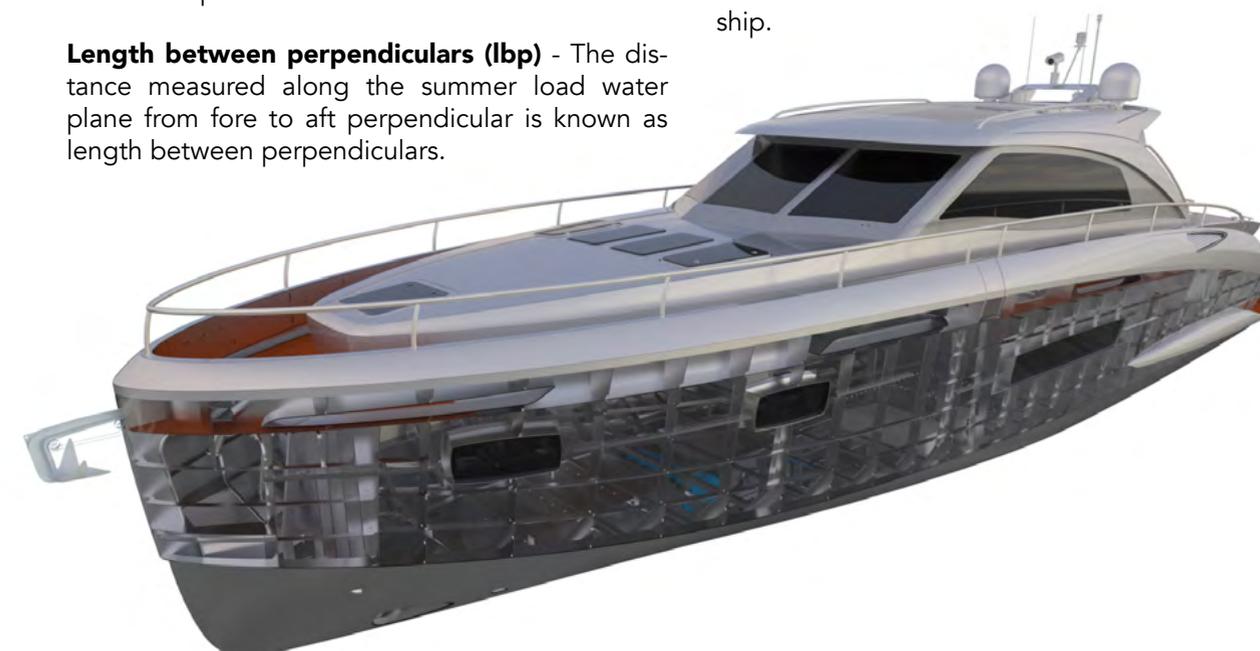
Forward perpendicular - The vertical line passing through the intersection of the summer load line with the stem's forward side.

Aft perpendicular - The line perpendicular to the waterplane and passing through the centreline of the rudder pintles.

Length between perpendiculars (lbp) - The distance measured along the summer load water plane from fore to aft perpendicular is known as length between perpendiculars.



Inside the hull, there are bulkheads. The primary function of **bulkheads** is to divide a ship into several watertight compartments. Though most watertight bulkheads are transverse in orientation, some yachts also have longitudinal watertight bulkheads for longitudinal compartmentalisation. The **Collision bulkhead** is the forward-most bulkhead in a ship.



Underwater Elements

Located under the hull, you also find equipment such as the propellers, stabilisers and rudders.

Propellers are motorised blades that spin fast, which makes the yacht move through the water.

Stabilisers help reduce the rolling of the yacht. They are fins configured with a flap rudder mounted horizontally and use the water's streaming velocity along the yacht's side to reduce rolling. They are like the fins of a whale used to stabilise the boat. The fin is operated such that at any moment, a reaction force is produced. Upward, or downward contrary to the acceleration of the side of the yacht. Stabilisers help prevent it from rolling too drastically, especially in bad weather greatly improving the guests' comfort. The most advanced form is zero-speed stabilisers, which are more sophisticated. They keep the yacht from rolling both underway and at anchor. Generally, a must have for most superyachts, especially if entered into the

charter market.

A **rudder** is a flat piece of metal used to steer the yacht, aerofoil section. It is to develop a transverse steering force on the aft end of a yacht, using the reaction force of the water flowing along the yacht and over the rudder. The rudder is usually shaped so that the water flow can be deflected effectively combined with the minimum resistance possible.

The **rudderstock** is essentially a vertical shaft or tube that provides the primary connection between the rudder's blade (the flat section that imparts the steering force) and the vessel's steering system. The arm on a rudder shaft transmits the steering torque to the rudder blade.

Bow/Stern thrusters are transversal propulsion devices built into, or mounted to, either the bow or stern, to make it more maneuverable. Bow thrusters make docking easier since they allow the cap-

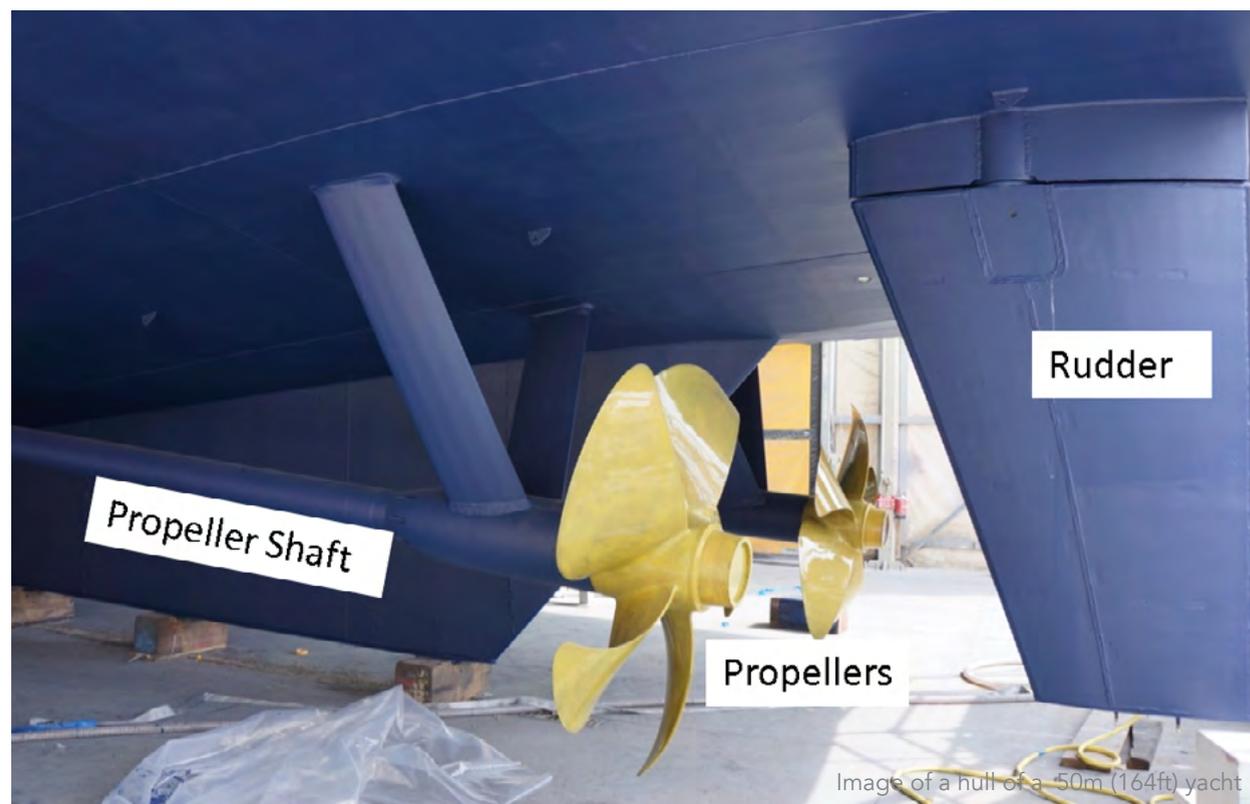
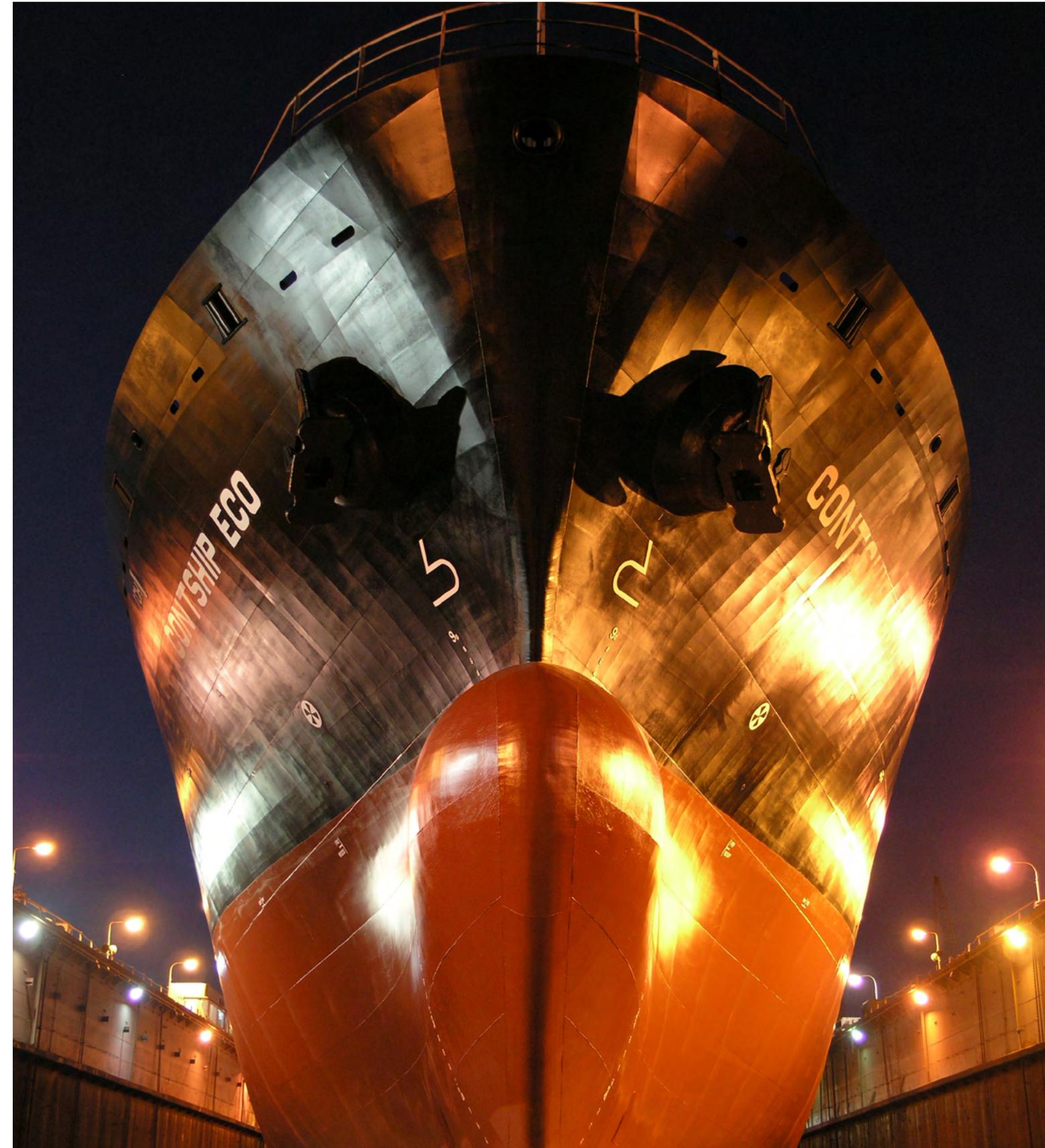


Image of a hull of a 50m (164ft) yacht



tain to turn the vessel to port or starboard side, without using the primary propulsion mechanism.

A **transducer** serves as an antenna for the yacht's sonar system. However, it could also be the speed log of the echo sounder. There are different types, measuring speed or depth with different directions and even 3D possibilities making it great for fish finding.

Bulbous bow - A protruding bulb at the front of the yacht, below the waterline. It modifies how the water flows around the hull, reducing drag and increasing speed, range, fuel efficiency, and stability. Yachts with bulbous bows generally have better fuel efficiency than ones without. A bulbous bow also increases the forward part's buoyancy and hence reduces the pitching of the ship. A well-designed bow can also increase the hulls' efficiency.

Rubbing strake or Rub rail can be compared with the bumpers on a car or bumper cars at the fair.

These are attached to the boat by means of bolting rubber or rope on smaller boats and welding round or triangle forms to prevent damage to the hull when bumped into by another boat or even the dock.

SUPERSTRUCTURE

We have previously defined the hull, which is the bottom shell of the boat. The structure above deck is the super structure.

The superstructure is often made of a different material than the hull. For example, the hull can be made in steel and use aluminum as the super structure because it is a lighter material hence making the total weight of the vessel lighter (which is better for stability with less weight up high).

The superstructure is not considered to contribute to the structural strength of the yacht.

Corrosion

Since most of the hull and equipment is made from metal, corrosion is a problem that concerns all the immersed elements of waterborne vessels. As with most materials, it is not possible to completely eliminate corrosion. Therefore, it is advisable not to aim at prevention but rather at maximum reduction of destruction caused by it.

Most frequently, the elements vulnerable to corrosion are protected with a coat of paint.

Cathodic protection, a technique in which the construction is protected is connected to an external anode that serves as an additional solution. The protected metal surface becomes a cathode, an electrode on which reduction reaction of electroactive substance takes place instead of metal oxidation or corrosion. In this case, the anode is a less precious metal called protector (Mg, Zn, Al) that is purposefully sacrificed. Protector corrodes to prevent the primary metal from corrosion.

There are solutions like Cathelco and other electrical devices used to prevent marine growth on the hull and corrosion.

The superstructure deck is the deck in the superstructure but is not a significant part of the vessel's structural strength.

Portholes - The windows in a yacht's hull or boat are called portholes.

Cockpit - The outdoor area of a sailing yacht (typically in the stern) where guests sit and eat and where the captain may steer and control the boat. The term cockpit on a yacht is usually used for fishing, the fishing cockpit.

Volumes

The size of a yacht can be expressed by using terms which describe the characteristic of the yacht.

All aspects concerning the measurements of seagoing vessels are listed in the Certificate of Registry. The treaty applies to vessels with a minimum length of 24m (78.74ft). In many countries, the gross tonnage is used to calculate harbour dues and pilotage charges and determine the crew's size.

To determine the size of the yacht the **Register Ton** is used. It is based on the volume where one register ton = 100cft, or 2.83m³.

The **Gross Tonnage (GT)** is calculated using a formula that takes into account the yacht's volume in cubic metres below the main deck and the enclosed spaces above the main deck.

All measurements used in the calculation are moulded dimensions.

To minimise the yacht's daily expenses, the yacht owner will often keep the GT as low as possible.

The **Net Tonnage (NT)** is also a non-dimensional number that describes the volume.

The NT is derived from the GT by subtracting the volumes occupied by:

- » Crew
- » Navigation equipment
- » The propulsion equipment
- » Workshops
- » Ballast

The NT may not be less than 30% of the GT. Another way to think of net tonnage is the earning capacity, for example, on a commercial ship, it would be how much cargo space can the ship carry, or how much guest space a yacht has.

Helideck

Usually, helidecks are for yachts over 60m (197ft). There are two types of helidecks on board. Fully certified helideck and what is casually called 'touch and go'. All helidecks have to have integrated lighting and foldable or removable handrails.

A **fully certified** helideck needs to have a refueling system, meaning they have to have their own 'gas station onboard'. Having this increases a lot of risks of fire and explosion; therefore, some regulations apply. In some cases, all materials used onboard need to be fire-proof.

In a fully certified helideck, a yacht can have a helicopter on board at all times. There are ways to strap the aircraft to the yacht so that it does not move during cruising.

A **touch-and-go** helideck is for picking up and dropping off passengers. The aircraft does not stay on board during cruising, and there is no possibility to refuel.

More details on helidecks on the chapter of Yacht Aviation.

MAIN AREAS ON A YACHT

A yacht can be split into different areas; hereby, we will describe the main ones being:

- » GUEST AREA
- » CREW AREA
- » THE DECK
- » TECHNICAL AREA

Guest Areas

These are the areas used by the yacht owners or charter guests. It's usually a more luxurious area than the crew or technical area.

Guest areas include the cabins, which are the private rooms and living compartments on a yacht. It also includes the living areas such as the saloons and dining rooms. Unique features like the cinema, beach club, spa, and sundeck are also part of the guest area.

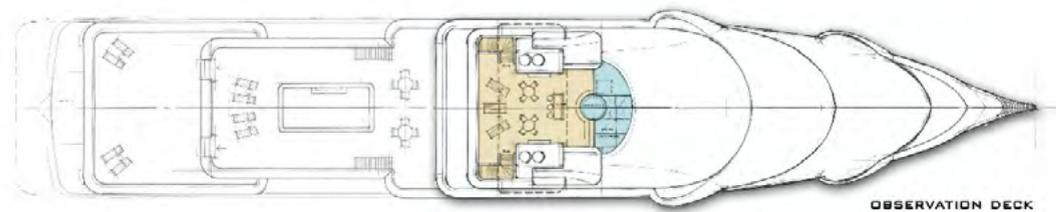
Main cabin (owners suite) is referred as the cabin of the yacht owner, typically is the best and largest cabin onboard. Some yachts have two owners therefore there are two main cabins. The VIP cabin is typically the second-best cabin onboard any yacht.

The remaining cabins are the guest cabins, which are usually smaller than the main cabin.

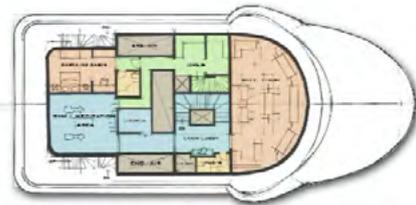
A **double cabin** includes a double bed to sleep two guests. Not to be confused with **'twin cabin,'** which means a cabin with two twin-size beds. A twin cabin is often best suited for children or friends.



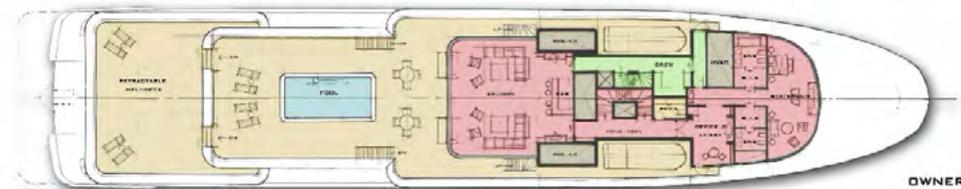
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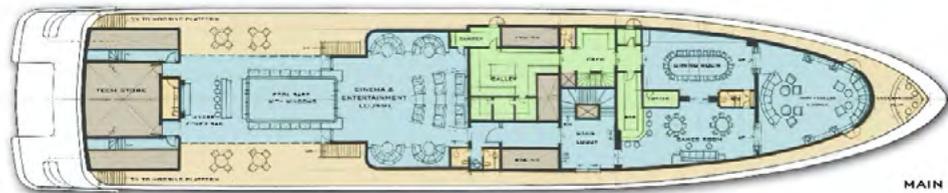
OBSERVATION DECK



BRIDGE DECK



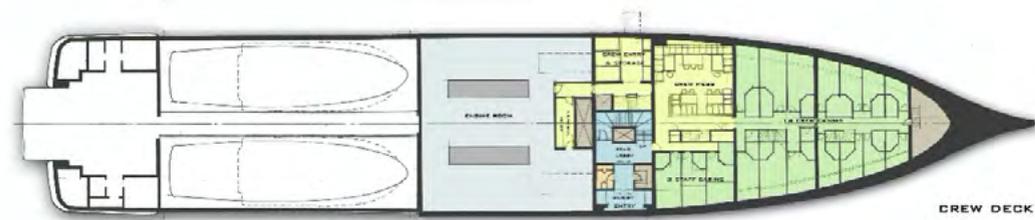
OWNER'S DECK



MAIN DECK



LOWER DECK



CREW DECK

- OWNER
- GUEST - SHARED
- GUEST - CABINS
- CAPTAIN
- TECHNICAL
- CREW

90m Expedition Motor yacht by Sorgiovanni Design

Crew Areas

The crew areas as the name implies are the areas where the crew work and reside.

All of the yacht controls are located on **the bridge**, which is sometimes called the cockpit (sailing boat term).

The **helm** is one of the most important parts of a boat. This is where you steer the yacht when moving along the water. In most cases, the helm is a wheel used to control the direction of the boat.

The **galley** is the nautical term for the kitchen. It is situated strategically for the crew to provide a good service.

The **crew mess/lounge** is the dining room for the crew. It is the main area for the crew to hang out, and usually has a galley, a saloon with tv, and a place to relax.

The **laundry** is the space for washing and drying machines. Depending on the boat's size, some yachts have two laundries, one for the guests and one for the crew.

The **crew cabins** are the bedrooms for the crew. Depending on the build, they all look different, and some are more comfortable than others. Most crew members share cabins. There are individual private cabins for senior and chief crew members like the captain and chief engineer on bigger yachts.

A **wet head** is a bathroom that serves as both the toilet/sink area and the shower compartment, meaning the sink and toilet get wet when you use the showerhead.

The **captain's office** is the space designated for the captain to do his work. This is the principal management office of the vessel.

Engine Control Room usually abbreviated to ECR, is generally located in the engine room and is where the engineer controls all the machinery and equipment of the yacht.

Storerooms contain provisions and cold stores for food. There are also luggage lockers, engine spare parts, paint lockers, garbage lockers located near incinerators and the galley. There is also specific storage for wine and liquor stores, medical stores, AV/IT, linen stores, and workshops.

Bridge **wing control stations** offer extra visibility and an overview of the mooring situation to create maximum safety when docking.

Day head is the nautical term for toilets onboard.

ECR = Engine Control Room. Sometimes called MCR (Machinery Control Room).

Deck Areas

Deck - The deck is a portion of the boat that sits on top of the hull. It is the part of the yacht where you can walk around outside. This portion of the vessel works as a roof to the hull and is also where much of the boat's work takes place.

Sundeck is the highest deck on the yacht.

Forecastle - The forward part of the upper deck. Traditionally stowage and crew quarters.

Passarelle - The passageway you walk on from the dock to the yacht. Often incorrectly called a gang-plank or gangway.

Fenders - This protective gear is usually made of plastic or rubber. The fenders prevent a vessel from moving into a dock. They prevent damage to the boat and the dock should the two come into contact with each other.

Gunnel - Also known as the gunwale, this is an edge along the side of a boat. It works to add to the structure and provide strength to the overall design.

Hatch - The hatch is an opening that connects the bottom of the boat and the deck. Some yachts have multiple hatches, depending on the design and the purpose of the vessel. Going down using the hatch is also called "going below." When moving up through the hatch, the term is "going top-side."

Accommodation ladder - Gangway found on the side of the vessel.

Monkey island - The deck is located directly above the ship's navigating bridge, usually located at the topmost accessible-height deck or mast base. It is also referred to as the flying bridge on top of a pilothouse. Sailors would use this place to perform solar and stellar observations.

Anchor island - Where anchor winches are located and controlled.

Embarkation station - The place where passengers get onboard when arriving from a tender.

Muster station - The place where everybody onboard congregates in case of an emergency.

Swimming platform - The area located in the aft of the yacht close to the waterline usually used to jump into the sea or park tenders.

An integrated bridge is capable of handling all items as:

- » Radar
- » Electronic charts
- » Conning information systems



Photo Courtesy Lürssen, credits Klaus Jordan

Technical Area

Many types of equipment are located in the technical area, such as the air conditioning, AV and IT rooms, monitoring systems, switchboards, etc.

We will describe hereby the main ones. However, the leading technical equipment, such as engines and generators, will be described in more detail in the following chapters.

The Bridge

This is where all navigation and communication equipment are located. Communications are provided from here to the engine room, steering gear room, cabins, etc. The bridge is usually located aft, midship or forward.

ECDIS (Electronic Chart Display & Information System): It is more accepted nowadays to have paperless navigation using ECDIS. However, in order to be entirely paperless, the ECDIS system that is installed must be class and flag state-approved and must be kept up-to-date as the adopted hydrographic bureau issues chart corrections. This system shows the chart information and route on screen, making track monitoring and navigational information visible. The system includes information from the echo sounder, AIS (Automatic Identification System), and Navtex allowing quick detection of dangerous situations and immediately alerting the operator.

Chart radar - This system shows the electronic chart information and the radar's full picture on one screen.

Conning information screen - The conning information system is directly derived from the aircraft industry. Its screen presents information previously displayed on a dedicated instrument.

Communication system

GMDSS rules require, for instance, VHF for short-range, MF and HF for medium and long-range and Sat C for short and long-range. These systems cannot receive or transmit digital in the manner of

shore-side ADSL or broadband; they do, however, transmit essential safety data in a secure format that is internationally recognised.

At typical coning information screen will show:

- » GPS (global positioning system)
- » Gyro heading indicates true north
- » Magnetic heading indicates magnetic north
- » Rudder angle
- » Yachts speed
- » Main engine RPM
- » Pitch of CPP
- » Anemometer

There is a trend towards using V-sat terminals offering high-speed communications comparable to shore-side telephone systems. V-sat offers VOIP telephony (Voice Over Internet Protocol) connecting directly to the PSTN (Public Switched Telephone Network)

Inmarsat is one of the satellite communication providers that provide satellite communications to the marine industry, which offer worldwide coverage at high speed.

Navigation equipment

Something important to note is that of the power supply of the equipment. It must be supplied from the emergency switchboard to ensure power in case the main supply fails.

Depending on the size of the yacht, they have different equipment, but the main ones are:

- » Radars
- » An automatic pilot
- » Two independent satellite positionings systems
- » An echo sounder with recorder
- » A log, speed, and distance indicator
- » Magnetic compass
- » A gyro compass

Steering and Stabilisation

The yacht's steering and maneuverability systems ensures maximum comfort for guests and crew during anchor and sail conditions and consists of mooring equipment, which is equipment used to moore the yacht.

Anchor - An anchor is a heavy object that drops down into the water to keep a boat or yacht from moving. It is the final safety resource of a yacht. The most common anchor used on superyachts is the stockless or pool anchor. It is very heavy, an anchor on a 90m (295ft) yacht can weigh up to 2,000 kg!

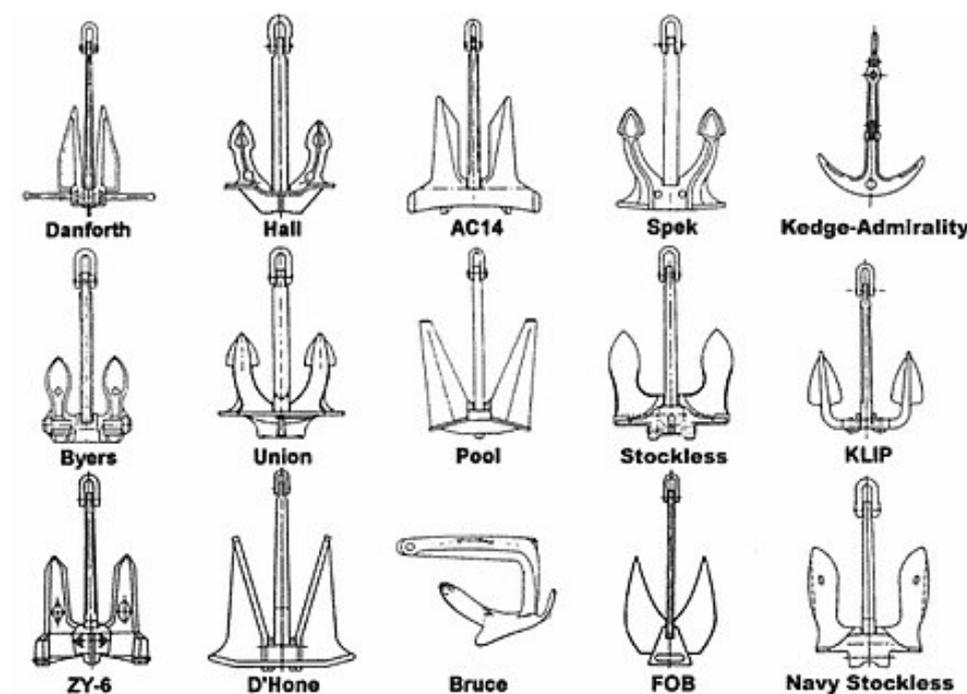
In an **anchor chain** the units of measure are in shackles, each shackle used to mean 15 fathoms, a fathom equaling 6ft therefore $15 \times 6 = 90\text{ft}$, a modern shackle of chain is calculated at 30m(98ft) a vessels anchor chain is usually between 7 and 12 shackles depending on the size of the vessel.

Anchor winches are used to release the anchor and the chain. On superyachts they are usually electric. Anchor winches usually called a windlass, are used to heave in and pay out the anchors and anchor chains in a controlled way.

An anchor aims to secure the end of the anchor chain of a yacht to the seabed.

Much of the 'holding power' is the weight and resistance of the chain laying on the seabed in shallow water, reasons for doing so can be:

- » The yacht has to wait 'on anchor' at sea until a berth inside the port becomes available.
- » To help maneuver.
- » In emergencies to avoid grounding.
- » To allow for recreation – swimming, toys, diving, snorkeling etc.



Legal requirements

A certificate issued by class must be provided for each anchor. It shows the type, materials used, weight, and testing. The same applies to chain cables. The captain is responsible for checking the condition of the anchor itself.

Usually, one anchor is needed; however, two anchors may be required under severe weather conditions or in a strong current. A yacht cannot sail from any port where an anchor has been lost unless the flag state has granted special permission.

Fresh water and water makers

Yachts can make their own fresh water from seawater. There are two ways of doing this, by evaporating seawater, or by reverse osmosis.

There are also systems onboard to manage hot and cold water supply, including pressure pumps and different water types.

Fresh water - Water that is used for drinking.

Black water - Water that has been in contact with human solid waste (fecal matter) wastewater from toilets.

Grey water - Has not had contact with solid waste but is used mainly to wash, bath, cook, and clean.

Sewage system

This is to treat water and convert grey and black water into clean water. Most ports won't allow the yachts to discharge their black and grey water inside the port. Yachts that have an authorised sewage system, meaning that once the water comes out of the yacht, it is already purified, they are allowed to pump out inside the port.

BASICS ON ELECTRICITY

Electricity is a clean method of energy transport and consists of two basic types:

- » Direct Current (DC)
- » Alternating Current (AC)

The behavior of electricity can be compared to that of water.

Voltage can be compared to water pressure and current to water flow.

Voltage is measured when the system is at rest and is measured in volts. Current transports an electrical charge from high voltage to low voltage and is measured in amperes.

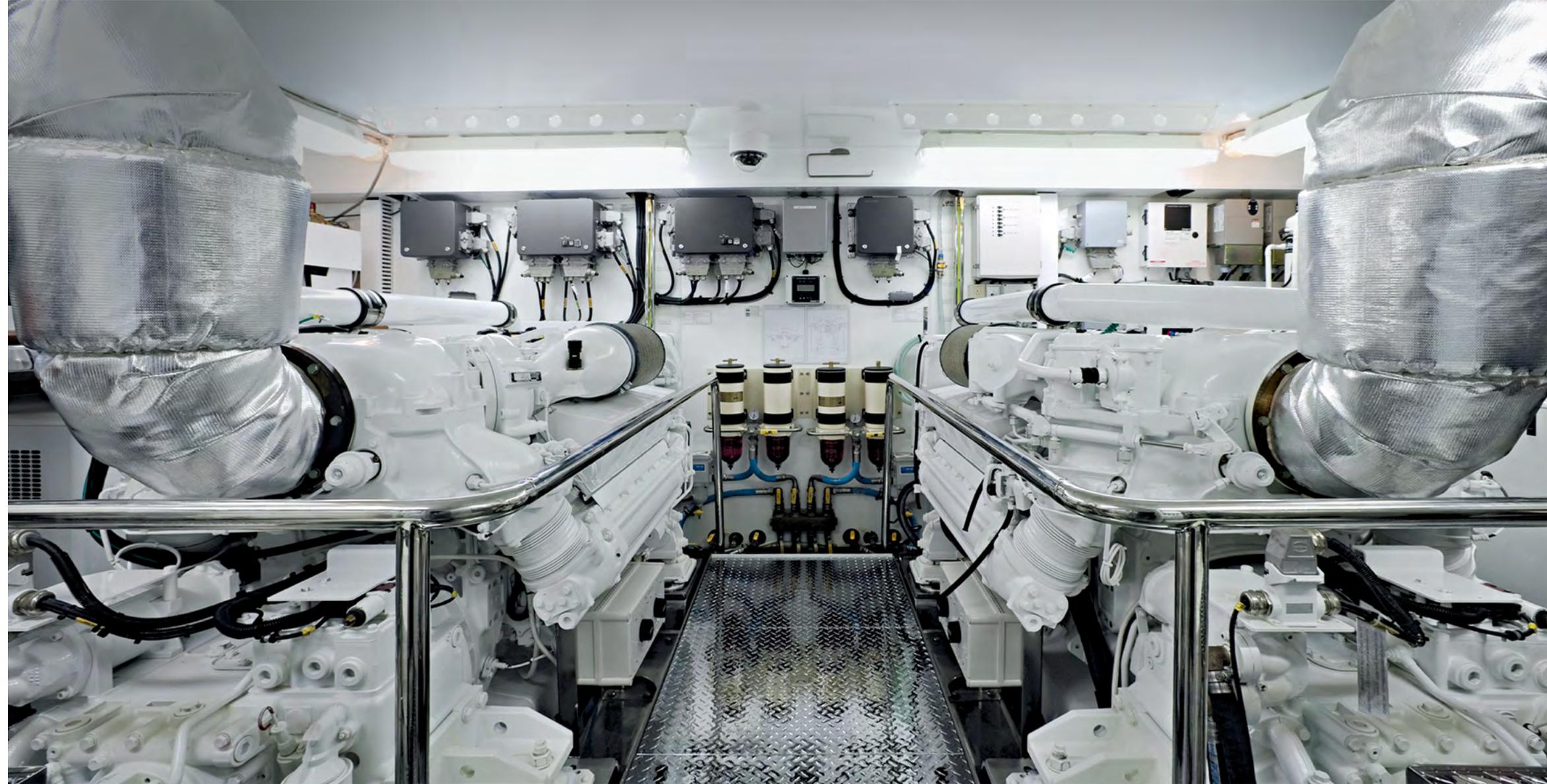
Direct current is the only type of electricity that can be found in nature. Examples can be lightning, or when you walk on carpet, touch a metal appliance, and get a shock. A generator or dynamo can produce direct current, and it can be stored in batteries. For example, hybrid cars are based on the principle, creating energy in stored batteries and they use a combination of electric motor and fuel engine.

A battery consists of two or more metals in a conductive environment (usually an acid). The metals dissolve, thereby ionising and creating a difference in potential between them.

Generator capacity is expressed in kilowatt-hours (KW-hrs) battery capacity in amperes per hour.

Even though DC is quite simple at coordinating multiple generators and running parallel, it's a simple way of storing energy in batteries; there are some disadvantages of DC meaning it requires extensive maintenance. That is why nowadays, there are motors made for alternating current from DC by using DC and AC converters.

A permanent magnet produces alternative current on a shaft with the poles fitted transversely to the shaft rotating inside a tubular coil called the stator.



The rotating magnets will induce a frequency in a stator coil proportional to the rotation speed. The rotation speed is usually expressed in RPM or revolutions per minute. The frequency of an AC generator depends on the number of magnet poles and the rotation speed.

Hotel load - Is the electricity generated for purposes other than propulsion such as climate control, communications, entertainment, lighting, and refrigeration. The electrical load of such systems is termed the 'hotel load.'

OTHER BASIC YACHTING TERMINOLOGY

Berth - The sleeping area of a yacht inside a port is the berth, often referred to as a bunk.

Boom crane - Crane used on deck often to launch tenders and jetski's but also for supplies.

Beam crane - When tenders are stored inside the vessel (tender garage), a beam crane is installed to launch tenders and other toys via doors in the hull where these cranes slide out.

Buoy (normally pronounced 'boowie', but sometimes 'boy') - An anchored floating object that serves as a navigation aid or hazard warning.

Bollards or cleats - Used to tie the mooring lines so a yacht can moor to a dock. These are explicitly positioned so that the crew can secure the yacht in such a way that the yacht cannot move even in heavy weather.

Bulwarks - The solid barrier on the outside of the side decks which extend from the gunwale and are contiguous with the hull.

Cranes - Cranes are used to handle heavy equipment (rescue boats, jet skis, etc.) from the deck to the water (like lifting a tender from the garage to the water).

Capstans - Are winches located in strategic positions on a yacht to help the crew pull the yacht towards the dock in a controlled manner, either electrical or hydraulically. On sailing yachts, these are also used to hoist the sails and keep tension on them.

Fairleads - Most of the time are rounded stainless steel openings in the railing and bulwarks that give access to the bollards from the dock for mooring procedures. Sometimes these are executed with "bullhorns", which are cleats welded to the fairleads.

Freeing Ports - Periodic holes at the base of the bulwarks to allow large volumes of water that wash aboard to evacuate quickly.

Fore Mast - A fore mast is required for navigation lights and deck lights. Usually hydraulically-operated like a telescope.

Knots - Knots describe the speed of a boat in nautical miles per hour. A single nautical mile is the same as a little more than 1.15 regular miles, meaning that a boat traveling at 25 knots is going almost 29 miles per hour.

Line - Rope used on a boat or yacht is called a line. Deckhands need to know how to tie proper knots in the lines to keep boats secure when they are docked.

Life-saving appliances include **life rafts** required for emergency situations. On an 80m (262ft) yacht, you need six of them, carrying approximately four people per raft. There are usually three on each side.

A yacht is to carry one or more life rafts on either side of the vessel of such aggregate capacity for all persons aboard.

Mooring - Mooring is the place on land where you secure a boat. Moorings can be piers or wharfs.

Nautical Mile - The equivalent to 1852 metres exactly, taken to be one minute of latitude.

Scuppers - The gutter around the perimeter of every deck that drains water to the sea.

Scope - The scope is often understood as a formula where it equals the length of an anchor line divided by the depth of water below the yacht measured from the deck. While it can be a little complicated to understand, the scope must be correct to ensure the yacht is anchored correctly.

Windlasses - Are winches with a double function to lower or hoist the anchors and, most of the time, are equipped with capstans on top. You use mooring lines to secure the yacht in the marina by using grainlines instead of the anchors, as this is not always allowed.

Watertight - Prevention of the passage of water in either direction.

Weathertight - Capable of preventing a significant ingress of water when subjected to a hose test.

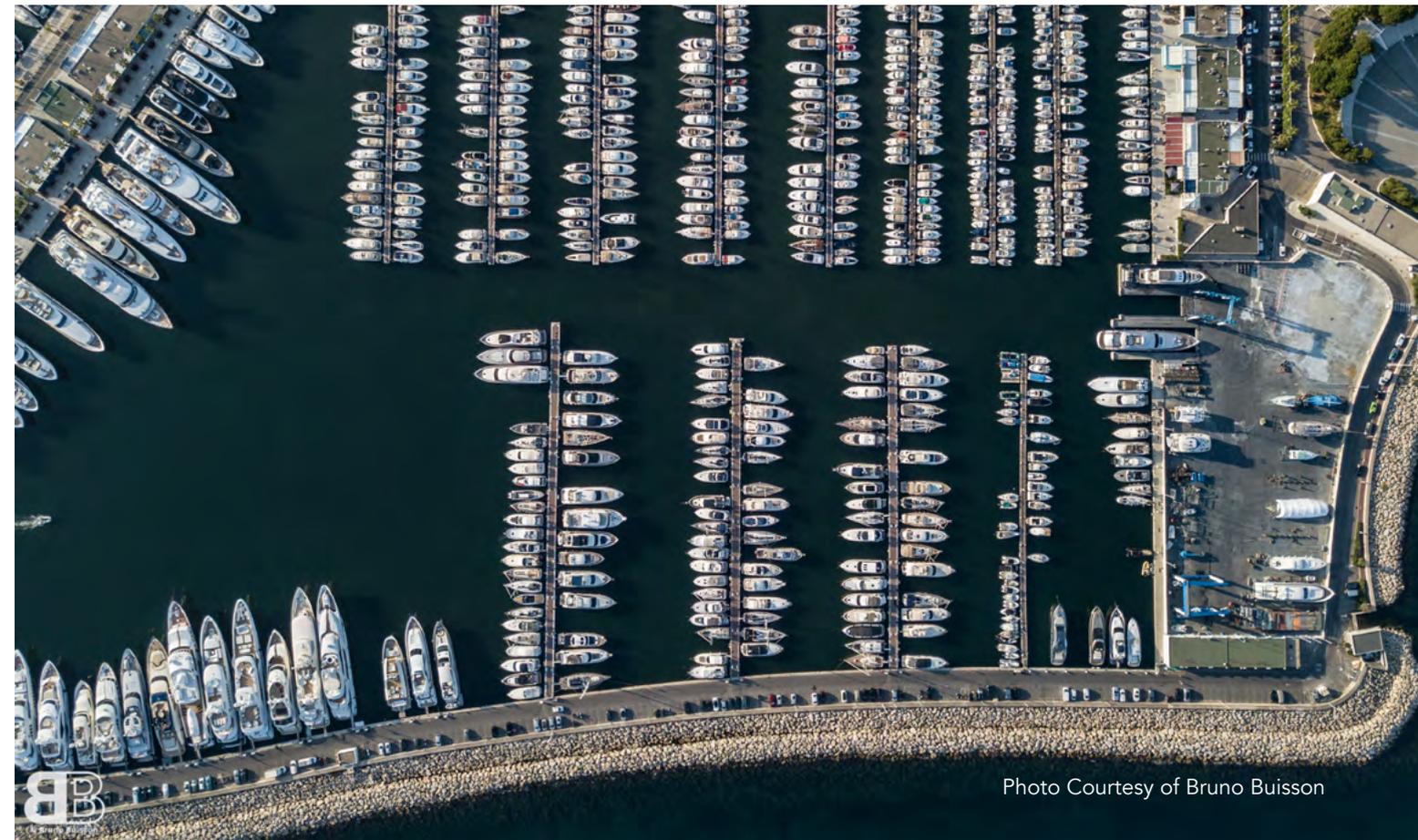


Photo Courtesy of Bruno Buisson



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Notes

For more information visit www.superyachtindustry-forum.com

This is the superyacht community, for owners, professionals and experts, where ideas can be shared, open questions can be asked (even anonymous if you wish) open debates can be held; to learn, engage into yachting and improve the industry, moving forward by making it even more professional and more enjoyable!

Some general remarks on the principles and style of the book must be made. It is written colloquially to make it easy for anyone regardless of their background and experience in yachting to understand. It started as a “yachting for dummies” to help readers truly understand and digest the information. We could write an entire book on each chapter, as every chapter is a world in itself, but we decided to be an “introduction-to” rather than in-depth academy textbook.

The author aims at forging a strong link between the contents of the book and the view of its readers, and any reactions, recommendations or criticism are highly welcome, please leave your comments, feedback and remarks on the forum section “feedback on the book” in order to help the new versions improve.

A references section may be found at the end of the book. No specific reference is given in the text, but contributions from different sources and individuals are identified.

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