
DOMINATOR

THE FUTURE IS NOW

VIRTUAL REALITY

BRINGS
A NEW DIMENSION
TO YACHT DESIGN
AND CONSTRUCTION.

BART Bouwhuis was frustrated. The 170-footer's transom, on paper, didn't look right. It was a big project for Vripack, the firm he co-founded. And now the 73-year-old owner of the yacht was standing in the office growing frustrated, too.

"He doesn't have an iPad," Bouwhuis recalls. "He doesn't have Internet. He says he doesn't like it. I said, 'Wait a minute, Jack; I have a solution, but you have to come with me and have an open mind.'"

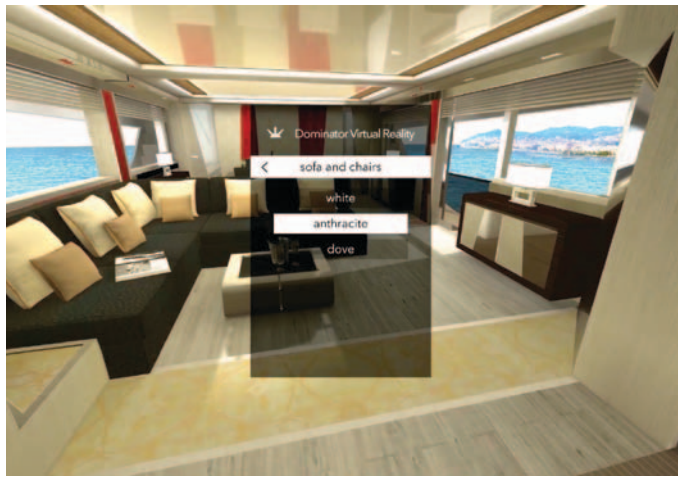
Bouwhuis led the owner into a room where Vripack, earlier this year, had set up one of the yachting industry's first true virtual-reality experiences.

"Wow, this is cool!" the owner cried out. "Now I can see my boat. Now I understand what you were talking about. Can I see more? Can I see it from the front? What else can I see?"

It was a good question, one that even Bouwhuis couldn't completely answer. Vripack is one of several companies at the forefront of bringing virtual reality to the yachting landscape, where the technology's capabilities remain nascent, and where even the leading players aren't quite sure what the future will bring. Only one thing is certain: The experience of buying, designing and building yachts is already changing, and likely for the better.

THE EVOLUTION

One of the things that makes today's virtual-reality experience possible is computer-aided design (CAD), which began to appear in the 1970s. CAD eventually led to such advancements as the photo-realistic drawings of yacht concepts we all know today. It also led to the yachting industry's first documented use of what's known as augmented reality, which enhances the existing environment, compared with virtual reality, which outright replaces that environment all around us.



Some owners may have encountered augmented reality as far back as 2011, when Texas-based Hidden Creative Ltd. uploaded a YouTube video showing how an app could make a yacht brochure look like it was "coming to life" in 3-D. By 2013, Fraser Yachts and Sunseeker had their own augmented-reality experiences. That same year, at the Fort Lauderdale International Boat Show, Lürssen began to blur the line between augmented and virtual reality. The builder digitally unveiled 282-foot (86.1-meter) *Quattroelle* by taking photographs of the new build in Europe and offering show-goers in Florida a set of goggles. People could "walk through" the yacht in a way that felt like walking inside still photographs. At the time, Lürssen Sales Director Michael Bremen said he thought it was the first use of virtual-reality technology in the yachting industry.

Fast forward to this year's boat shows in Miami, Düsseldorf and Dubai, where a pair of open-top pods appeared at the Dominator booth. They were made of carbon fiber, stainless steel and leather. The Italian builder invited guests to choose one of 40 pairs of Prada loafers with sensors across the soles. Next, a guest placed an Oculus Rift virtual-reality headset over her eyes. She then stepped into the pod, whose circular, treadmill-type floor would respond to the shoe sensors, making her feel as though she were walking inside a yacht, taking her wherever she looked with the headset.

What she actually was doing was "walking" inside the photo-realistic, 3-D CAD drawings of Dominator's 85-foot (26-meter) Ilumen concept—a yacht that does not exist in real life.

"Oh!" one woman exclaimed, reaching from the aft-deck entrance toward what she perceived as a salon window. "I can see the sea!"

Dominator staff could see in real time, on a flat-screen television, the 2-D version of whatever the guest saw inside the headset. When a man reached out toward the lifelike hors d'oeuvres on an aft-deck table, a Dominator employee in real life held out a tray with actual nibbles. The same thing happened when goggle-wearers reached out to grab what they perceived as glasses of champagne.

"Moët & Chandon is our global champagne partner, so we have

THE BENEFITS OF **AUGMENTED REALITY**

While virtual reality is all the rage right now, augmented reality is in some cases still a highly valuable tool for yacht owners.

"They're both huge things," says Gregory C. Marshall, a naval architect based in British Columbia. "The virtual reality requires a 3-D model to be inside of. In a yacht, we 3-D model the whole thing, so it's easy to put you inside of it. But with augmented reality, let's say your sundeck on the yacht you already have looks boring and you wanted to do a refit. You want new furniture. You're wondering, 'What would it look like if I put this chair right here?'"

Using augmented reality, you can stand on your sundeck and hold your smartphone over a piece of paper with a code that tells your screen to create a true-to-size image of the chair. Or, perhaps, six different chairs you're trying to choose among.

"You can go, 'Okay, I can see it right here,'" Marshall says. "You basically print out six pieces of paper, and each paper has a little code on it. You can decide and say, 'That lounger is too big.' So you take away that piece of paper. It's like you're shopping for the chairs from six different stores right there on your sundeck."

included the Moët bottles in the salon, on the flybridge and in the fridges of the galley," says Angela Pernsteiner, managing partner of design and development at Dominator. "Users are amazed about the level of detail possible in such an experience."

It was arguably the first use of modern virtual-reality technology at a boat show, an idea Dominator conceived to market the Ilumen before building the yacht.

"My brother Christoph, who is the IT expert, and I did intense research and found out that there is virtual-reality technology from the video games industry where you can have a real feeling, as opposed to only some 3-D animations with goggles," Pernsteiner says. "We took the experience and the tools from the 'nerdy' video gaming industry and combined it with the luxury elements."

The Dominator system also lets users change the yacht by using a joystick control—combining yacht marketing and yacht design.

"If the client walks through the main salon and wishes to have light gray oak flooring instead of the dark brown oak parquet, this can be realized within seconds," Pernsteiner says. "Exchanging the striato olimpico marble in the owner's bathroom on the main deck with calacatta oro marble, or marveling the changes from zebrano wood to teak wood in the owner's suite, has never been easier before. Other interactive features include watching the opening and closing of the moonroof in the Ilumen owner's suite or viewing the mechanism of the retractable roof of the carbon hardtop on the flybridge."

Vripack, too, is using its virtual-reality technology for yacht marketing—and not just on custom builds. For example, with the Bavaria E40, Vripack needs to market a design with a helm station uniquely positioned aft, creating a vantage point that even the most experienced owners of express motoryachts have trouble conceiving.

"We were really struggling, how to bring across this feeling of this helm station," Bouwhuis says. "You can make a rough mockup with a helm station and a chair, but you're in a joiner shop. How do you get the feeling of the boat? The atmosphere of this unique position? The virtual environment allows you to have the view, the joinery around you—you can almost understand the atmosphere."

Monaco-based Yachting Partners International had a similar challenge in marketing 344-foot (105-meter) Raptor, a concept yacht. YPI Group, too, turned to virtual reality, building a system that experts say is even more advanced because regular computers aren't strong enough to process the experience.

"The stuff that we're doing, I can pretty confidently say at this juncture, absolutely nobody else is doing," says Mark Duncan, group commercial director for YPI Group. "The guys at [Dutch technology firm] Bricks & Goggles have developed an Oculus Rift system exclusively for us. You have various levels of virtual reality just within those goggles. We have to go around with a big, massive box on a little chariot of wheels in order to do this for clients. No computer can handle the amount of data that this processes."

'READY PLAYER ONE'

In 2011, science-fiction author Ernest Cline published the novel "Ready Player One." It's set in the year 2044. The world has gone to hell, and people spend their days jacked into a computer system called OASIS, where they can be anything they want to be on any of 10,000 planets.

One critic called the book a "nerdgasm." Ingmar Vroege, co-founder at Bricks & Goggles, calls it a source of technological inspiration.

"Everyone has a virtual reality headset, and everyone logs into their virtual reality world to work, go to school, hang out with their friends," Vroege says. "A lot of things that people are doing with virtual reality right now are described in that book."

It's not just the nerds having a gasm about the prospects. Mark Duncan, group commercial director at YPI Group, says he can see that same future quite clearly for the yachting industry—and he's wide-eyed about all that it could mean.

"The photo-realism of it all is what's so scary," Duncan says. "Up until now, 3-D graphics and experiences, you had a separation between real life and virtual reality. No matter how good the graphics were or the renderings were, you could still tell they weren't real, either with the way it looked or the fluidity of the movement. With this technology, that line is very blurry now. You have to imagine the mind games that could play with people who can't determine the difference. Maybe we're getting to a point where nobody wants a boat at all. Why would you want to pay for a real one when you can get the same feeling just sitting anywhere at home?"

The Dominator experience at boat shows includes shoes with sensors attached to the soles. They tell the virtual-reality program which direction users are turning in real life.

Experience Raptor in Virtual Reality, at Home, Right Now

When Yachting Partners International hired Bricks & Goggles to create a virtual-reality experience for its 344-foot (105-meter) Raptor concept yacht, the Bricks & Goggles team also generated a smartphone app that lets users see a version at home.

The app is free. Just search for Bricks & Goggles in the app store, and then scroll down to the app called "Superyacht VR." It will work as long as you have a smartphone with the processing power of an iPhone 6 or higher.

Next, go to your favorite search engine and type "Google Cardboard." You'll see what is essentially a foldable cardboard box with lenses that turn your smartphone into a virtual-reality headset. Google sells Cardboard for $15.

Once you receive the Cardboard in the mail, load up your smartphone app, put your phone into the Cardboard and watch. In your living room, you'll see a scaled-back version of what yacht owners are being shown in the Oculus Rift system at Yachting Partners International.

I tried this with an iPhone 6s. I could definitely tell that I was looking at renderings as opposed to real life, and the app with Google Cardboard is a guided tour instead of a system that I could control, like the real version with Oculus Rift headsets. But the app was still pretty cool—like being inside a theme-park ride with IMAX screens all around. When the app took me outside the yacht, as if I were lifting off from a helicopter and looking back toward the boat at anchor, I could feel the motion in my stomach. (That's usually how I feel in real life, too.) When I was inside the yacht, I felt fine, and I said out loud to nobody, "Wow."

The YPI Group system came to be because sales broker Russell Crump has a 14-year-old son who took him to play a video game while wearing Oculus Rift goggles at a shopping mall in Nice, France. Soon after, Crump saw a Bricks & Goggles demonstration at the Monaco Yacht Show. The two teams now have the photo-realism down and are perfecting the speed at which image frames beam into people's eyes, so viewers don't experience vertigo.

THE PAYOFF POTENTIAL

Today's virtual-reality systems also offer benefits that could save yacht owners hundreds of thousands, if not millions of dollars in the shipyard.

Dominator, Vripack and YPI Group all say that because photo-realistic 3-D CAD drawings are the basis for what viewers see, the virtual-reality systems can be used by anyone—designers, naval architects, even yacht chefs who want to experience the way galley cabinets will be positioned before that part of a yacht goes into build.

"The spaces are what they really are," Duncan says. "When it comes to mechanics and engineering, we're thinking it can be very useful for those guys in laying out the systems, what size components they need, the storage space, whether people can reach things or get to things. A lot of things that have long been mathematics, you'll actually be able to feel it."

Imagine a yacht engineer being able to see whether he can reach a fuel filter before the shipyard starts construction.

"Every pump manufacturer and water-maker manufacturer has three-dimensional drawings that they're putting into CAD designs when they're designing the yacht," Crump says. "We can put that in and see if they like it. Seven times out of 10, the engineer wants to change something, and the owner gets hit with a change order for a minimum $300,000. Now you can change it before it's even built, and it costs you nothing."

Dominator is already using the technology in this way. As Pernsteiner says, "Our design team or the engineers step into the virtual reality quite often to see the changes they are making or verify spaces in real time."

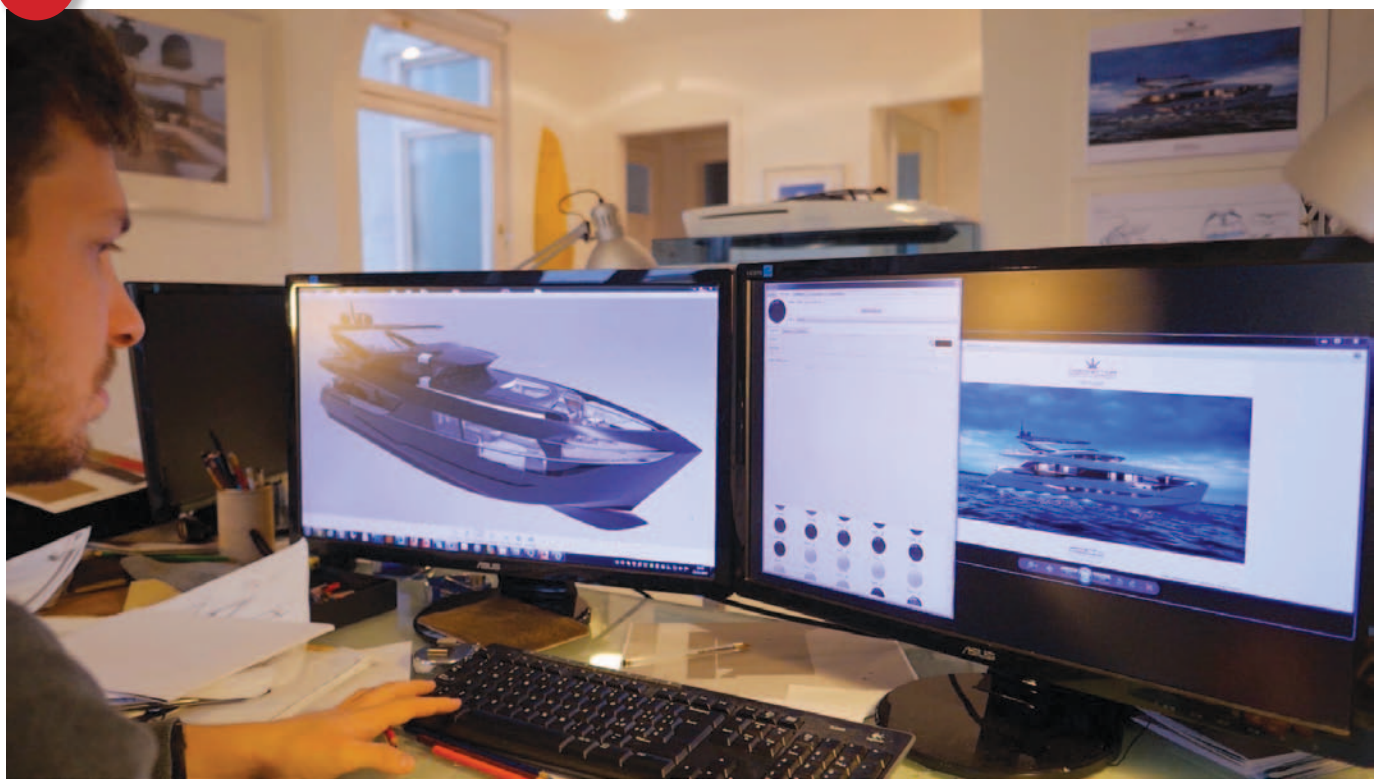
Vripack's Bouwhuis cites engine-room design as perhaps the most important, untapped resource for yacht owners within existing virtual-reality systems.

"This potentially is even way more substantial than the design validation," Bouwhuis says. "Yacht systems and yacht engine rooms are getting so complex that to make sure the captain understands what he's going to get, and the yacht engineer understands what he's going to get, and the amount of value from a requested modification—there, you could for sure apply the same tool."

He adds, "Imagine all the improvements you can make that will

When virtual-reality users at the Dominator boat-show booth reach out for what they perceive as Champagne and hors d'oeuvres, a staffer makes the experience seem real.

WWW. **VIDEO** | *Experience the thrill of virtual reality in yacht design.* http://bit.ly/2arOL1O



The computer-aided design (CAD) drawings that yacht designers and naval architects have used for years are now being repurposed to create virtual-reality experiences. The files are fed into 3-D programs that make viewers feel like they are inside the photo-realistic CAD drawings.

save maintenance costs. Now you'll understand if you can reach something or turn a valve."

YACHTING IN THE AGE OF 'AVATAR'

Nobody is sure where virtual reality is going next, a truth as exhilarating as it is mind-boggling. As YPI Group learned when it wanted enhanced technology, more computer processing power was needed. The company couldn't use any old laptop. It had to build a special box.

The movie industry has already made the next leap beyond that box. Cloud computing allows the processing capability of thousands of computers at once, which is how the geeks of Hollywood are turning out eye-popping films like 2015's "The Walk." Having the equivalent of 15,000 simultaneous cloud processors let the special-effects geniuses do 9.1 million hours' worth of image rendering in just a couple of months' time—and then feed those shockingly realistic, IMAX-ready film images into yet another program that turned them into a 3-D video game. So today, wearing goggles like the Oculus Rift headset that is being used in yachting applications, video-gamers can step right into scenes from the movie, which look more photo-realistic than ever.

Ingmar Vroege, co-founder at Bricks & Goggles, says there's no reason the yachting world can't move into that level of virtual reality next.

"We're like game designers, only we do it for a functional project like yachts or houses," he says. "We basically build a game, and we try to make the game as realistic as possible. You can see us as game designers with the plans from a shipyard."

Vroege already has received a request from one yacht owner for a realistic version not only of his yacht, but also of his private jet.

"They asked if they can make a jet room, so I can jet there with my friends in virtual reality, all together from different homes, and then we can all hang out together on the yacht in virtual reality," Vroege says. "That is already possible. It won't take long. Maybe two or three years. Maybe sooner."

He sees the future of virtual reality in yachting about to collide with the technology from games like "World of Warcraft," in which teams can play together in real time onscreen while actually inside their homes elsewhere.

"They're not putting on a virtual-reality headset yet," Vroege says. "They're sitting at their computers. But the headset, that's the next step."

Imagine a yacht designer calling your home in Chicago from his office in London. You both put on virtual-reality headsets. The application launches, and you're inside your yacht concept with the designer, off the coast of Portofino, Italy, deciding how to perfect the view of the harbor from what will someday be the foldout balcony in your master stateroom.

"We're aiming to do that in 2017," Vroege says. "We really think it's possible. I know what we've done in a year, and I think this is doable in a year and a half. We already have the infrastructure there. It's just making sure that everyone has an Oculus Rift.