



a **TRADITION**
of **INNOVATION**



***Mounted
Bearing
Units***

There is currently a silent revolution ongoing, at the shadow of the pandemic, in optimizing the design, functionalities, mount-ability, and traceability of mounted bearing units. Several bearing producers are trying to upgrade their product and add new functionalities to it. While one of these companies, already implemented key innovations at the mounted bearing units, which reduces the total cost of ownership of the end-user by -40% through its unique design, outstanding quality, and optimized mounting capabilities.

The company behind this unique product is COC Inc. We have tried to reveal the story behind this revolutionary design and innovation of the COC mounted bearing units, during an interview with Eiichi Kobayashi, Chief Executive Officer at COC Inc. and the former President of FYH bearings. Eiichi Kobayashi's story is one with full of passion for quality, and a 70-year long tradition of innovation.



Can you tell us more about your background and history of COC Inc.?

COC is short for Cross Ocean Company, it may not sound like a bearing manufacturer, some people think that it sounds like a surf shop.

I love the mounted bearing units and I think most people don't even know what mounted bearing units are. My father started to make mounted ball bearing units for the first time in Japan in 1950. That was FYH bearings. He was a keen engineer and designed machines to make those bearings and made them by himself. So mounted bearings were always part of my life. My father told me he studied the bearing design from Seal Master catalogs for his first bearings. His unique machines allowed a tight fit between the inserts and housing. The inserts were interchangeable with any other unit. Other manufacturers including Seal Master had to choose the inserts and housings to find the right fit for assemble and they weren't interchangeable.

FYH is a family-owned company and the board members were my relatives. I often had disagreements with them about the way to do business. I cared very much about every detail of the product and was always looking for the new designs. The other board members didn't like the idea of spending money to change the designs because they said the distributors have never asked for it. My feeling was that we were the experts on mounted bearing units and should always be pushing to make a better product that would last longer. My focus was to produce the best for the customers although some distributors might not like the products getting a longer life, so they could sell more bearings. I was the youngest board member and the president of both FYH and FYH USA at that time. However, I grew tired of the arguments and decided to leave FYH.

I left FYH in 2018 and would have retired, but I still loved mounted bearing units so much and decided to finish the projects which I could not finish at FYH.

cover the cost of the mold. I founded the company to sell my own design surfboard bags. That company was Cross Ocean Inc. founded in 2001. The company was just an online web shop and suspended the company operations when the last bag was sold, since I was too busy with FYH.

“ For spherical roller bearings, it is important that the seal lips keep the same pressure during shaft misalignments, otherwise the outside air can find its' way into the inside of the bearing easily. ”

When I left FYH in 2018, I remembered my suspended Cross Ocean Inc. company. However, I wanted to continue to innovate bearing units rather than surfboard bags. I thought Cross Ocean Inc. doesn't sound like the name of a bearing company, and I changed the company name to COC Inc. I still wanted to keep my sea turtle logo from Cross Ocean which referred to the strong board bags, similar as the sea turtles crossing oceans to surf the waves around the world. I felt same way for my bearings. I want our bearings from Japan last long life like sea turtles and cross the oceans for the customers in the world. So I thought this logo was also perfect for my new bearing company. COC logo with flipped C inside turtle represents connecting people around the world.

Thankfully I have many connections to factories in China and they offered to help my project and allow COC to be a fabless company. They are high quality companies and I can see a big difference in quality from 20 years ago. I founded COC in September 2018 and we shipped our first order in October 2019, which was amazingly quick. It took only a year to figure out our design, produce samples, undergo extensive testing and figure out packaging. I appreciate all their passion for our products.

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After studying in California, I worked at FYH USA in Illinois and visited the Seal Master factory in Aurora. That was late 1980's and before they closed the factory over there. I had the meeting with their manufacturing manager Mr. French and he brought the very first FYH catalog from his book shelf. He said, “your father copied your designs from us and now we are asking you to produce parts for us.” and laughed. The OEM business was running only for a couple of years because of the Anti-Dumping Duty against Japanese bearings started at those times. Since then, I traveled around the world to promote FYH and built one of the largest bearing factories in China exclusively for mounted ball bearing units. I also worked with other manufactures like KOYO (JTEKT) and TIMKEN for many years.

My other love is surfing. I surfed every day when I was young. I traveled many places around the world to surf. I usually carried three to four surfboards depending on the destination. The only problem was the board bag to travel. The padded board bags at that time didn't fit correctly and they were hard to carry. So, I invented the new board bag which was expandable to be able to change the length of the bag to fit the different sizes of the surfboards. It was made with the combination of plastic hard shells and padded covers to protect the surfboards perfectly. I had often gotten dings on my surfboards traveling by airplane. My surfboard bag design had two wheels at the end of the bag and I could carry the heavy bag easily. I made the prototype and all my surfing friends liked it very much. The plastic hard shell needed a mold to make it and I made 50 pieces of them to

Eiichi Kobayashi,
CEO/Founder of COC INC.



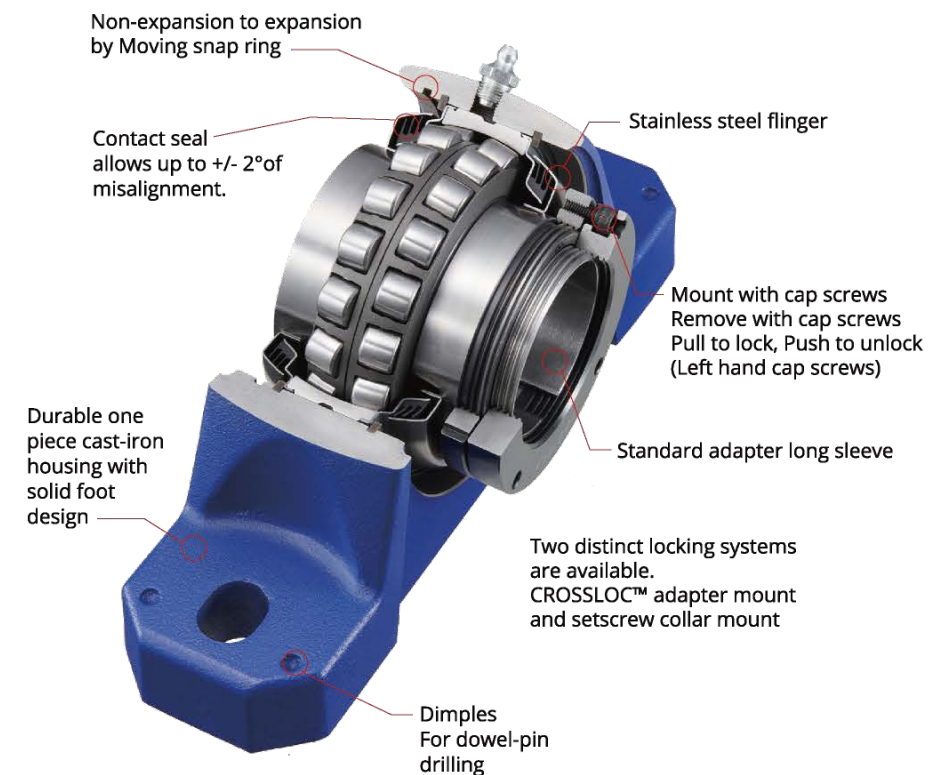
So, what were the projects you couldn't finish at FYH?

There were two main projects I could not finish. The first was the spherical roller bearing units. I wanted to change the classic two-piece plummer block units to an one piece unitized unit. I invented the unitized SRB units with Z Lock at FYH but they were not compatible enough with SN plummer block units. Another project was stainless ball bearing units for the food market. I had redesigned that series at FYH but they were not near completion when I left.

“ Adapters require feeler gauges to check the clearance inside the bearings, so I invented CROSSLOC™ locking system for our SRB units. ”

What do you concern most to design the bearing units?

I have been working on the sealing and locking for mounted bearing units for many years. Contamination and installation are main reasons the L10 life of bearing are reduced. Increasing the number of seal lips could make for better protection, but the torque during rotation gets higher at the same time. The higher torque makes the temperature inside the bearings higher, and the air pressure inside of the bearing gets lower and if any point is not properly sealed, the outside air finds its way into the inside of the bearing pulling in contaminants. I am always concerned about the designs of the seal lips to keep the torque lower while providing maximum protection. For spherical roller bearings, it is important that the seal lips keep the same pressure during shaft misalignments, otherwise the outside air can find its way into the inside of the bearing easily.



How's about the installation?

I personally think that adapters are the best locking system. Adapters hold the shaft from 360° degrees concentrically through the length of the adapter sleeve. Adapters eliminate the vibrations and are good for high-speed applications as well. The only problem with adapters is they are difficult to install and uninstall. Adapters require feeler gauges to check the clearance inside the bearings, so I invented CROSSLOC™ locking system for our SRB units. CROSSLOC™ is so simple and easy that even a 10-year-old can

install and uninstall the units. We use the standard adapter sleeve for this locking system and this is why our unitized SRB units are 100% compatible with standard SN plummer block units. Our competitors use a one size smaller insert for their unitized plummer blocks. Their adapter mount inserts are compatible with setscrew locking inserts. The standard 22200K inserts used in the SN plummer block are one size bigger than straight bore inserts to accommodate the adapter. Since the insert being used is smaller, the load rating of their units is less than the traditional SN plummer block.



So your CROSSLOC™ bearings are not compatible with setscrew lock inserts?

CROSSLOC™ CX inserts are not compatible. But we just added a new line called CROSSLOC™ CXC which is the cylindrical bore (setscrew straight bore insert) equivalent. We use our original thinner wall, lower angle tapered sleeve for CROSSLOC™ CXC to match with the bore sizes of our CS setscrew lock inserts.

“ We designed a new locking system called OCCLOC™. ”

So is CROSSLOC™ available for all housing styles now?

Yes, and the SAF plumber block version is available as well now. I love these new housings. All sizes of both CXC and SAF units will be available by this summer.

That's great. Please tell us about your stainless-steel ball bearing units now.

Our stainless-steel series is called Saniline. I have been studying the solid polymer lubricant for food applications. However, it costs more and I'm not sure about the recycling of those materials. I designed a new seal and flinger to get the IP69K certification, which is the highest rating of the protection against the ingress of dust and water. Saniline inserts are lubricated for life and there is no grease fitting on the housings anymore. We don't need to worry about people over greasing during maintenance like traditional stainless-steel units which can breed bacteria. We have added the stand-off housings to this lineup that is a half inch off from the mounting

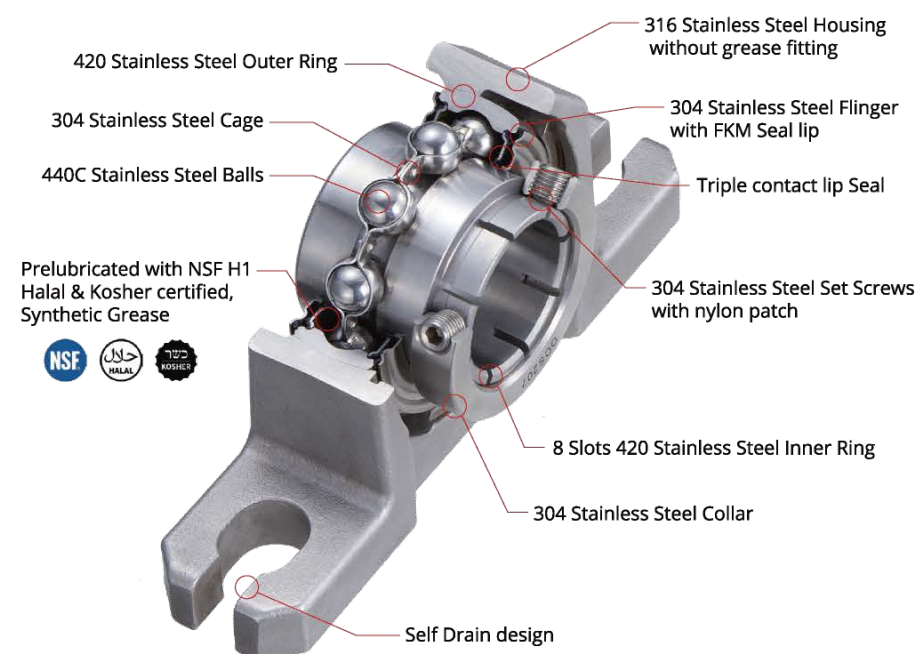


surface. The stand-off units are good for wash down clean-in-place applications to meet HACCP/HARPC requirements.

We designed a new locking system called OCCLOC™. This idea came from an old MB Centric-Lok design. I still have their ER insert somewhere in my bearing collection. The inner ring has 8 slots compared to Centric-Lok's 4 slots. We have tested designs using from 2 slots to 8 slots to find the best holding power. Two setscrews are located 120° apart on the locking collar and the locking collar pulls the far side of inner ring during tightening of the setscrews. The solution is that the shaft can remain very clean without any damage from the bearings. The Skwezloc locking style

uses a thicker collar for the cap screw to tighten properly. The OCCLOC™ can save the cost of the expensive stainless material by using a thinner collar.

We don't use plastic materials at all to help protecting the environment. The plastic housings are a good cost savings for some applications, but when they get scratched, they can become entrapment points for bacteria. We also have a stainless-steel safety cover for these units. There is no machining for this cover on the housing. Just twist the cover to lock. It's very easy to install and uninstall for cleaning. You can check our website crossocean.com for the details.



Saniline



OCCLOC™



We see the QR code on your products. What information does it contain?

The QR code on the housing has the web link and serial number. You can scan it on site with your phone to get dimensions and torque setting values, installation videos and maintenance information for your scanned product size. You can use the serial number for the warranty and to trace the products. Each QR code is unique

and there are no two same QR codes in the world. For CROSSLOC™ products, we have added the instruction on the collar directly by laser marking. CROSSLOC™ may be easy enough without the instructions, but we want to make sure that installing and uninstalling is simple for every user. The instructions are in English and you can scan the QR code for other languages.

How was your 2020? And what are your plans for 2021?

We announced COC for the first time in September 2019 and booked trade shows throughout 2020. We were excited to introduce our new brand around the world. COVID-19 destroyed all those plans quite quickly. The trade shows we were scheduled to attend were cancelled and we were on-hold with everything in 2020. This was very tough situation to start-up a company like ours. We spent all the year of 2020 for working very hard on our new products such as CROSSLOC™ CXC, SAF version, and Saniline. We focused on the safety and cleanliness of our products even more. We are keeping our fingers crossed until we are able to attend the trade shows in 2021.

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