

WILL STAINLESS BLADE STEEL RUST IN A SALTWATER ENVIRONMENT?

I have never really had any trouble with corrosion resistance on any of the stainless steels I use for knife blades. The reason for this is that after each use in and around salt water I always rinse the blade with fresh water, dry it off and give it a quick shot of "Pam" non stick cooking oil before putting it away in the sheath. The term "stainless steel" is pretty descriptive. Stainless means that the steel will stain less not stain at all. Chrome is the alloy element that does the trick. The stainless 400 steels vary in the amount of chrome in the mix. "The low end is about 14% and the high end 18%. Other factors like the amount of carbon, other alloy elements and the heat treating will all affect the final efficiency of the chrome to resist corrosion. If the blade is not cleaned and put away dry it can rust and pit. How serious can this be? Well I inadvertently found out. The blade below is probably the worst case possible.



This blade is 154 CM at RC 60. How did it get so corroded? Here's the story: I like to fish in Baja and make at least 2 fishing trips down there each year. We always end up in Bahia de Los Angeles and have a favorite Panga guide we fish with. A little more than a year ago I made

him a fillet knife as a gift in appreciation for the many great trips we have had with him. Bahia Los Angeles is on the Sea of Cortez about 400 miles below the border. It can get hot and humid in the summer and the water in the sea has a higher concentration of salt than in the Pacific. So the ambient conditions are pretty harsh. When I gave the skipper the knife he said ***"it's too pretty to use, I may break it?"*** I said ***"don't worry about it, just use it like your other knives and then let me know how it performs"***.

Last summer we went back down and fished with him again. I asked him how his knife did and could I see it. He dug it out of the under seat compartment and handed it to me. It was a mess, the sheath was wet and mildewed, and the copper rivets were all green. I pulled the knife out of the sheath and saw the corrosion and tried not to let my face reflect what I was feeling. He apologized for the condition and told me that it must have been his mate that let it get in that condition. I said, ***"No problem I will take it home and clean it up and bring it back to you next trip"***. Before I cleaned it up I took the photo above. I guess this answers the question, Stainless will corrode in salt water conditions if not given at least reasonable care.



The photo above shows the blade as cleaned up. I started with 220 grit wet/dry paper and finished at 400 grit. If you look close you can see some small residual pits. On the whole the blade is still useable

and I was surprised that it did clean up as well as it did. This is an extreme example of what can happen to 154CM if it is never rinsed off and if it is put away in a damp salt saturated sheath. Even though the blade was corroded it still was used to fillet more than a hundred Yellow Tail and many Grouper over about an 8 month period. I think the particle metallurgy steels like CPM 154 CPM S30V, CPM S90V would probably fare a little better due to the finer grain structure. In any case this is one point on the curve under an actual use/abuse real world test.