Summary provided by **Roger Massicotte** at Sailing Club May 2024 Meeting

Citric acid passivation of stainless steel as discussed at tonight's meeting. This process is **essential** if any cutting, grinding or welding has been performed. Below is from a copyrighted SAE document so please do not publicly post it. The preceding instructions (not copied below) specify that parts should initially be free of rust but I have found that soaking in citric acid helps to **remove** rust especially with Scotch Brite or similar at e.g. half-way point of the process. I typically soak parts overnight at ambient temperature. Though supposedly also effective with 400 series (magnetic) stainless steel, I have only used the process on non-magnetic (aka austenitic or 300 series stainless). This is typically the only type used for marine environments (where type 316 is greatly preferred). Gulf Harbors water has high dissolved iron content which reduces the effectiveness of the process so I suggest distilled water. FYI, I purchased:
https://www.amazon.com/Granular-Concentrated-Anhydrous-Preservative-Cleaning/dp/B0BXYCL8KP?ref_=ast_sto_dp
but there are many other sources including local stores.
If items cannot be soaked (i.e., they are "permanently" mounted on your boat), citric acid solution is also available as a gel at a much higher price.
e.g.: https://citrisurf.com/citrisurf-77-plus/

3.1.3 Method 2 - Passivation in Citric Acid

3.1.3.1 Bath Composition

Parts shall be immersed in an aqueous solution of 4 to 10 weight percent citric acid, with additional wetting agents and inhibitors as applicable.

3.1.3.2 Operating Conditions

3.1.3.2.1 Temperature

Bath temperature shall be 70 to 160 °F (21 to 71 °C) with an immersion time of not less than 4 minutes for baths operating over 140 °F (60 °C), not less than 10 minutes for baths operating in the 120 to 140 °F (49 to 60 °C) range, not less than 20 minutes for baths operating in the range of 100 to 119 °F (38 to 48 °C) or not less than 30 minutes for baths operating below 100 °F (38 °C).

3.1.4 Final Rinse

Immediately after removal from the passivating solution the parts shall be thoroughly rinsed. Final rinse shall be carried out in clean water (see 8.13).